Commercial Fisheries Abstracts

a monthly summary of important developments for the fishery industries

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PACIFIC OCEANIC FISHERY
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Vol. 6 No. 11 November 1953

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U. S. Department of the Interior
Washington D. C.

UNITED STATES
DEPARTMENT OF THE INTERIOR

DOUGLAS McKAY, Secretary

FISH AND WILDLIFE SERVICE

JOHN L. FARLEY, Director

Commercial Fisheries Abstracts

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The abstracts in this leaflet may be left in their present form; but it is suggested that to make the most efficient use of them, they be cut out on the lines designated and filed by the number in the upper left-hand corner of each. For a full description of this filing system see "Fishery Technological Abstract Card System" by Maurice E. Stansby and K. L. Osterhaug, Fishery Leaflet No. 232, obtainable free by request from Fish and Wildlife Service, Washington 25, D. C.

In addition to the regular abstracts, there is included a bibliography of references of secondary importance (without abstracts). These may be cut off on the lines designated and pasted on standard 3 x 5-inch cards for filing.

Following is a brief outline of this filing system. The numbers apply to the first digit appearing on each card. For the meaning of subsequent digits, please see the above described leaflet.

0 General and theoretical
1 Fish by species
2 Fresh fish
3 Preserved fish
4 Oils
5 Vitamins
6 Fishery by-products
7 Analytical Methods
8 Composition
9 Miscellaneous

Issued with the approval of the Bureau of the Budget, December 29, 1950

9.2 QUARTERLY OUTLOOK FOR MARKETING FISHERY PRODUCTS, OCTOBER-DECEMBER, 1953

Anonymous
Fishery Leaflet 336r, United States Department of the Interior, Fish and Wildlife Service, Washington 25, D. C. (October, 1953)

This report is the nineteenth in a series of appraisals of economic conditions with predictions of marketing prospects for fishery commodities. The current issue forecasts the market outlook for some 50 specific fishery commodities over a three-month period. In addition the publication gives a summary of the situation in fishery commodities generally, with some reference to the market conditions for other foods. The report runs to 40 pages and is illustrated with some 60 charts.

A summary of the major features of the bulletin is carried on the inside front cover under the heading, "The Outlook at a Glance." In this epitomized statement, a high rate of business activity, with large consumer income and heavy consumer expenditures, is forecast. Some weakness in the markets for foods generally, despite a heavy demand, is predicted because of very large supplies. Among the classes of fishery commodities, edible fishery products as a whole are expected to find a fairly firm market. The market for most canned and cured fishery products is expected to be steady or firm. Among the byproducts, a steady market for fish meal is predicted; a dull market for fish oils; and a weak market for fish-liver oils.

The productivity of the fisheries is expected to decline progressively during the quarter, in line with the usual seasonal pattern, and the volume of production is expected to be somewhat less than in the fourth quarter of 1952. The gradual diminution in production will affect both fresh and frozen fishery products, as well as canned fishery

(over)

COMMERCIAL FISHERIES ABSTRACTS VOL. VI NO. 11 PAGE 1
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. ABSTRACTER: Ralph Russell

9.7 SOUTH AFRICA TO OPEN FISHERMEN'S TRAINING SCHOOL

Anonymous
U. S. Department of the Interior, Fish and Wildlife Service, Fishery Products Report No. 176, Seattle, Washington (September 8, 1953)

Beginning in 1954, young men wishing to become fishermen will receive a special training course at the South African Naval Gymnasium at Saldanha Bay. This course will be open to medically fit Europeans between the ages of 16 and 22 possessing a standard VII certificate. Training will take a year and 30 trainees will be admitted in 1954, reports the July 1953 South African Shipping News and Fishing Industry Review.

This vocational training scheme represents the culmination of more than 20 years of effort by Dr. Cecil Von Bonde and other leaders in the fishing industry to develop schools for fishermen.

The practical or vocational school would provide a competent and well-trained fisherman for the boats. The trainee would receive instruction in navigation, seamanship, engine maintenance, signalling, tending nets, and in several other aspects of fishing.

In a longer and more detailed schooling, young men could be trained for work ashore. The latter would take a comprehensive course which would include such subjects as fisheries science, plant operation, accounting, fisheries economics, etc. This fisheries school or university course would correspond to the instruction provided in the various agricultural colleges.

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COMMERCIAL FISHERIES ABSTRACTS VOL. VI NO. 11 PAGE 1
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. Reprinted in whole

7.83 A METHOD FOR THE ESTIMATION OF HYDROGEN IN PROTEINACIOUS FOOD PRODUCTS

Almy, L. H.
Journal of the American Chemical Society 47, 1381-90 (1925)

The method is based on Lauth's reaction: p-aminodimethylaniline + H_2S $\xrightarrow{HCl +\ \text{oxidizing agent}}$ methylene blue. The method developed consisted of:

1. Aeration of a suspension of the ground sample in water with carbon dioxide.
2. Collection of H_2S in zinc acetate.
3. Reaction to produce methylene blue followed by its colorimetric determination.

Reagents:

1. 1:1 HCl.
2. 0.04% p-aminodimethylaniline hydrochloride made to 100 ml. with 1:1 HCl. To be prepared fresh each day.
3. 27 g. $FeCl_3 \cdot 6\ H_2O$ dissolved in 500 ml. concentrated HCl and made to 1 liter. Just before use, dilute 1 part of this with 4 parts of water giving an 0.02M soln.
4. Stock solution of 20% zinc acetate in acetic acid made by treating 135 g. with a slight excess ZnO in water and bringing to 1000 ml. This to be diluted to make 2% and 0.6% solution as needed.
5. CO_2 in cylinder.
6. Diphenyl ether.

Standard solutions:

Into each of 15 volumetric flasks of 500 ml. capacity place 75 ml. of 2% zinc acetate solution. Add graduated amounts of recently boiled, cooled distilled water of from 315

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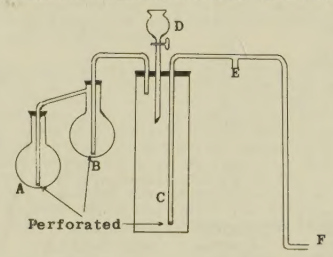
COMMERCIAL FISHERIES ABSTRACTS VOL. VI NO. 11 PAGE 1
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. ABSTRACTER: M. E. Stansby

7.83 A METHOD FOR THE ESTIMATION OF HYDROGEN IN PROTEINACIOUS FOOD PRODUCTS (Continued from Card 1)

Foaming can be minimized by use of a few drops diphenyl ether or in extreme cases by addition of 2 ml. 40% sodium tungstate.

The author used, in the manometer in place of water, a zinc chloride solution of specific gravity of 2. Readings on the manometer were then divided by 2. This helps to even out the flow of carbon dioxide gas.

EQUIPMENT FOR AERATING HYDROGEN SULFIDE FROM FOOD MATERIALS



A - 100 ml. volumetric flask
B - 80 to 100 ml. round bottom distilling flask
C - Aerating cylinder about 5 cm. diameter and 35 cm. high
D - Dropping funnel about 60 ml. capacity
E - Connection to manometer
F - Connection to CO_2 cylinder

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COMMERCIAL FISHERIES ABSTRACTS VOL. VI NO. 11 PAGE 1
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. ABSTRACTER: M. E. Stansby

QUARTERLY OUTLOOK REPORT

ESTIMATION OF HYDROGEN SULFIDE

SOUTH AFRICAN FISHERIES TRAINING SCHOOL

ESTIMATION OF HYDROGEN SULFIDE

7.83

to 374 ml. to the flasks so that with the H_2S solution, added below, the total volume will be 375 ml. Add to the flasks a freshly prepared, standardized (see below) solution of H_2S (B) of 1, 2, 3, 4, 5, 7, 10, 12.5, 15, 20, 25, 30, 40, 50, and 60 ml. followed immediately by 25 ml. of Reagent #2 and 5 ml. of 0.02M $FeCl_3$. The temperature of the contents of the flasks at the time of mixing should not vary by more than 1°C. from extremes. Agitate flask with a gentle horizontal motion after addition of each reagent. After about 2 hours dilute to the mark with water. These standards, if kept in a cool, dark place (refrigerator), are stable for at least 5 weeks. The standard H_2S solution (B) is made as follows. First make solution A by evolving H_2S from ferrous sulfide and HCl, wash with water and pass slowly for 1 to 2 minutes into about 300 ml. of cool, boiled, distilled water. Add an aliquot to an excess of a known amount of 0.01 N iodine solution. Titrate with 0.01N thiosulfate. Then add an amount of solution A corresponding to about 30 ml. 0.01 N solution to 450 ml. of dilute zinc acetate solution (15 ml. 2% soln. + 435 ml. water) in a 500 ml. volumetric flask and make to the mark. This is solution B and each ml. contains 10 micromilligrams (Mmilligrams) of H_2S and should be used immediately for preparing the standards.

Procedure:

Add 25 g. finely ground sample + 50 ml. water to C (diagram). Place 50 ml. 1:1 HCl in the dropping cylinder. Place 20 ml. 0.6% zinc acetate in A and 30 ml. of the same solution in B. Add all but a few drops of acid by opening stopcock of D. Turn off stopcock. Pass through carbon dioxide gas at pressure of 400 mm. of water for 15 minutes. Shut off CO_2. Disconnect A and B. Wash contents of distilling flask into volumetric flask with a final volume of about 90 ml. Add 5 ml. reagent #2. Shake gently, add 1 ml. 0.02M $FeCl_3$, and mix. Allow to stand 2 hours. Make volume to 100 ml. Compare color with that of standard most nearly of same color in a colorimeter.

If zinc acetate has precipitated it indicates the presence of excessively high amounts of sulfide. In this case add a little dilute HCl and make to mark. Remove an aliquot to another volumetric flask containing 15 ml. zinc acetate (2)% and make to the mark.

SEE CARD 2

7.83

Results on Fish

Kind	History	Length of holding time hours	Holding temperature °C	H_2S Mmicrograms per 100 grams	Remarks
Weakfish	Caught 1 day previous to test	0	--	0	--
		24	25	0	--
		48	25	41	Slightly putrid
Butterfish	Caught 1 day previous to test	0	--	5	--
		24	25	42	Slight odor
		48	25	378	Putrid
Spotted seatrout	Caught 1 day previous to test	0	--	0	--
		18	31	trace	Slight off odor
		24	31	64	Sour odor
		42	31	2200	Offensive odor
Kingfish	Caught 2 days before test	24	31	48	Spoiled but odor not vile

9.2

products and the byproducts. Despite the decreasing production, net additions to the total cold-storage stocks will continue until late in the year or early in 1954, when withdrawals will exceed freezings and the total holdings will enter a period of several months of decline. Holdings of frozen fishery products in cold storage are currently somewhat below those of a year earlier. This relative position is expected to prevail through the fourth quarter.

Importation of edible fishery products is expected to continue at a high level but not in as large a volume as in the fourth quarter of 1952. The export market is expected to be dull and the volume of exports of fishery products relatively small.

The Outlook Report forecasts a strong market for sablefish or black cod, swordfish, and croaker, and an active market for shrimp, lake trout, and canned salmon. A firm or fairly firm market is predicted for whiting, sardines, fresh and frozen salmon, mackerel, lobsters, and spiny lobsters; and, in addition, for oysters, canned shrimp, yellow pike, whitefish, yellow perch, and catfish. A steady or fairly steady market is forecast for halibut, sea trout, crabs, chubs, bluefish, butterfish, and salt herring; and also for canned mackerel, mullet, and red snapper. Other items expected to have a steady or fairly steady market are clams, canned oysters, mild-cured salmon, scup or porgy, smelt, and canned tuna. Among the products for which an unsettled market is anticipated are haddock, ocean perch, flounder, sole, canned herring, canned crabs, scallops, and lake herring. A dull market for cod, pollock, and smelt is expected, and a weak market for rockfishes, suckers, and carp.

9.7

The detailed course is still to come, but from 1955 the South African fishing industry can count on a trained nucleus of young fishermen. Not only will they have been well-grounded in fishing practice, but they should also show the benefits of a full year under naval discipline, for the 30 trainees are to be accepted as full-time cadets for one year in the South African Navy.

This, probably the most admirable feature of the new scheme, will provide the Navy with a valuable reservoir of trained men for use in an emergency. The 30 fishing trainees are to receive free board and lodging at the Gymnasium, they will get free medical treatment, free uniforms, and, instead of having to pay for their training, they will receive Navy rates of pay for full-time service. In addition, the fishing course exempts the recruit from normal part-time military training.

2.19 GOOD HANDLING HELPS TO KEEP COMPETITIVE

Harvey, E. W. (Director, Seafoods Laboratory, Astoria, Oregon)
Pacific Fisherman 51, No. 10, 40 (September, 1953)

The second of a series, this article discusses the importance of good handling of fish at sea in order that they may reach the consumer in first-class condition and thus be capable of competing with foreign fillets on the basis of quality.

Temperature control is of prime importance in reducing fish spoilage aboard fishing boats. Fish should be iced without delay, mixing finely crushed or flaked ice intimately with the whole fish and cramming the body cavity with ice in the case of eviscerated fish, in a precooled hold. Fish and ice should be stacked to a depth not exceeding 3 feet, with alternating layers of fish and ice. The use of metals in hold construction is superior to wood, both from the standpoint of temperature control and sanitation. Insulation of holds is important as an economizer of ice and as protection for uniform chilling. Small mechanical refrigeration systems have been installed on many vessels, not to replace ice, but to keep the ice in good condition on the outward trip, to precool the fish hold and to lower the rate of melting with the use of fans and ducts for blowing cold air behind the fish next to the side of the vessel and also directly into the hold. The use of ice is still considered best because in melting it keeps the fish wet and in so doing washes away bacteria. The Russians have been using iced sea water for cooling rather than ice. The fish are first immersed in a solution containing acetic acid and sodium chloride and then held in covered barrels of sea water containing crushed ice. For best results, 0.05% tannin is added, this being renewed every 12 hours. The fish are thus said to remain in rigor mortis for 36 hours. Experiments using carbon dioxide gas (30-40%) in fish holds as a bactericide have been conducted by the British. Some Canadians advocate prechilling the fish in tanks of chilled sea water before stowage.

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COMMERCIAL FISHERIES ABSTRACTS VOL. VI NO. 11 PAGE 3
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. ABSTRACTER: Roy C. Stevens

2.1121 CALIFORNIA DEVELOPS NEW MID-WATER TRAWL

Anonymous
U. S. Department of the Interior, Fish and Wildlife Service, Fishery Products Report No. 168, Seattle, Washington (August 26, 1953)

An almost untouched zone of the Pacific Ocean has been opened to commercial fishing and research by a new mid-water trawl developed and perfected by the California Department of Fish and Game, an August 5 release from that agency states.

Using the giant net towed behind a powerful state marine research vessel, fishing at almost any desired depth in the ocean was possible. Until now, most ocean fishing has been concentrated in two zones--near the surface and along the bottom.

The Assistant Chief of the Department's Marine Fisheries Branch reports that the trawl is being used to find out what kinds of fish, and how many, are in this salty "no man's land." Studies are planned for the life histories of many species, including unknown chapters in the ocean life of the young salmon.

While operations with the mid-water type of trawl are not new, having been conducted in Europe and Canada among other places, this modification is believed to have produced the first successful results with commercial-sized gear in California waters.

The new device, which can be used with standard otter-trawl gear, operates on the same principle as the parachute. Four quarter doors, or small kite-like deflectors at the corners of the net, are forced outward as the net is towed through the water. Pulling against each other, they stretch the mouth of the net tight. The modification eliminates

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UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. Reprinted in whole

2.1121 TRAWLING SKI

Anonymous
Pacific Fisherman 51, No. 10, 37 (September, 1953)

A ski runner device to prevent mudding of trawl nets has recently been developed by a Newport, Oregon fisherman.

The accompanying illustrations show how the ski is constructed and how it is rigged. The ground cable of the dandy line or bridle is run through a tube in the ski, which is secured forward of the wing of the trawl. Although the drawing shows the dandy line as being spliced into the eye of the ski, a shackle has been used by the inventor to facilitate placing on or removing the unit. The ski is free to slide forward on the ground line so that as the net is lifted, the ski will slide into the "bight" on the stern of the vessel. Thus the ski does not have to swing in the rigging.

The inventor, a trawl fisherman with 15 years of experience, has experimented with the ski for the past five years. He reports that since he has been using the ski his nets have never shown a sign of mud or sand.

The ski now being used weighs approximately 25 pounds out of water and 3 pounds submerged.

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COMMERCIAL FISHERIES ABSTRACTS VOL. VI NO. 11 PAGE 3
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. ABSTRACTER: Roy C. Stevens

2.3 TRANSFER ROLLERS FOR FILLET CONVEYOR BELTS

Power, H. E. (Atlantic Fisheries Experimental Station, Halifax, N. S.)
Fisheries Research Board of Canada, Progress Reports of the Atlantic Coast Stations, No. 56, 3 (July, 1953)

The two fillet transfer rollers shown in figures 1 and 2, this card, over, have been used to transfer fillets from one conveyor belt to another belt or drum traveling in the same direction. Roller No. 1 is a piece of ribbed 1-inch hose cut as long as the belt is wide and slipped over a piece of 1-inch-diameter steel shafting. Roller No. 2 is a 1 1/2-inch-diameter wooden roller cut as long as the belt is wide, and slotted longitudinally with twelve grooves 1/16-inch wide and 1/4-inch in depth to hold 12 rubber strips 1/2-inch wide and 1/16-inch thick.

Either of the transfer rollers will lift fillets from the first belt and place them free from folds and wrinkles in the same relative position on the second belt. For correct operation the transfer roller is placed very close to the discharge end of belt No. 1 with the shaft of both the belt pulley and the roller in a horizontal plane. Belt No. 2 is located somewhat below the level of the transfer roller to facilitate receipt of the fillets. The transfer roller is driven by means of a roller chain and sprockets with power derived from the pulley shaft of belt No. 1. For satisfactory operation the transfer roller must travel a little faster than belt No. 1, but not quite as fast as belt No. 2. In this way the speed of the transfer roller will lift the fillets from belt No. 1 and the speed of belt No. 2 will pull the fillets away from the transfer roller. Wrinkling and folding will be avoided and in many cases fillets with the ends doubled under will be straightened out.

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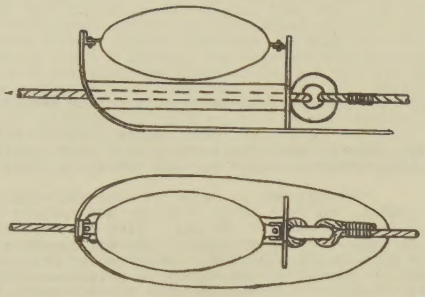
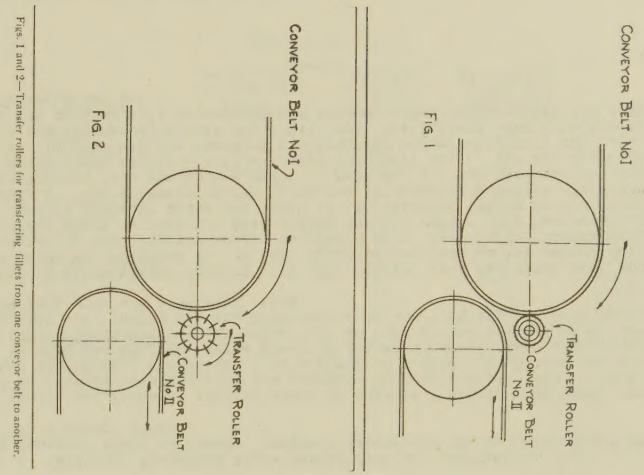
COMMERCIAL FISHERIES ABSTRACTS VOL. VI NO. 11 PAGE 3
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. ABSTRACTER: Martin Heerdt

2.1121



2.3



Figs. 1 and 2—Transfer rollers for transferring fillets from one conveyor belt to another.

2.19

Cleanliness of every surface with which the fish comes in contact is vital: decks, knives, tables, gloves, boxes, conveyors, holds, etc. Trash fish should be separated from the food fish; gurry should be thrown into a separate space rather than be mixed among the fish; dressed fish should be very thoroughly washed inside and out with fresh circulating sea water before stowage; and wash boxes should be drained completely after each lot of fish is washed. The surfaces of the "pen boards" should be thoroughly dried and coated at frequent intervals. If shelving is used in the hold, there should be a separate system of gutters into the bilges for each shelf so that contaminated water does not drip through each successive lower layer.

Damage resulting from rough handling can be avoided in a number of ways. The use of forks for transferring the fish from the wash box to the hatch can be eliminated by use of a rectangular basket or grating in the wash box that can be raised when full, the water drained and the fish discharged directly into the hold. Where pewing is necessary, it should be done only in the head.

Bruising can be cut to a minimum by avoiding throwing fish, walking in fish, the washing about in the hold, and piling too deeply in the hold. Bulk stowage should be avoided if possible. A liberal shelving system is an improvement, and boxing in ice is better still. It has been shown that boxed fish gain slightly in weight, while those stowed to depths of more than 3 feet lose weight and moisture greatly. At least two handlings of the fish are eliminated by the use of boxes: stowage in the fish hold, and unloading from the hold at landing. Regardless of the method of stowage, it is important that finely crushed ice be used.

Although ice is not the ideal method of preserving fresh fish, it is the only method found thus far to be economically practical.

2.1121

the fish-scaring bridle which runs in front of the ring-type net and earlier adaptations of the mid-water trawl. Only the amount of cable available limits the depth at which the new rig can be towed.

3.249

THE EFFECT OF ANTIOXIDANTS ON THE QUALITY OF FROZEN CHICKEN AND FISH

Rice, Lyla Mae
Master's thesis, Home Economics Department, University of Wisconsin, (1952), 52 pp.

Development of rancidity in frozen fish was followed by determination of peroxide number and by organoleptic analysis. Whitefish and lake trout from the Great Lakes were used in the experiments. The fish were first frozen, then lard was heated to 65 to 70°C. and the whole, frozen fish dipped therein to produce a lard glaze. In some cases ascorbic acid or butyl hydroxyanisole were dissolved in the lard before treating the fish. After storage of the treated, frozen fish for 8 weeks, the samples were somewhat rancid. Presence of either ascorbic acid or butyl hydroxyanisole in the lard glaze had no effect in retarding the development of rancidity.

The lard glaze itself protected the fish against moisture loss. It also seemed to hold the drip within the fish, making the apparent drip less.

 ABSTRACTER: M. E. Stansby

3.7

HOW TO DETERMINE IF ATMOSPHERIC CONDITIONS ARE FAVORABLE FOR THE ARTIFICIAL DRYING OF SALTED CODFISH

Legendre, R. (Gaspe Fisheries Experimental Station, Grande Riviere, P. Q.)
Fisheries Research Board of Canada, Progress Reports of the Atlantic Coast Stations, No. 56, 23 (July, 1953)

Ideal conditions for artificially drying salt codfish are 80°F. and 50 to 55 percent relative humidity. It is possible, however, to dry salt codfish at a dew point above 55°F. and at dew points between 60°F. and 65°F. but drying becomes increasingly slow with each rise in dew point temperature.

The author has constructed a diagram showing the lines of the criticial dew points as functions of various wet and dry bulb temperatures (Figure 4, this card, over). Also shown are the line of saturation of air with water vapor, upper temperature limit, and lower temperature limit.

To determine if atmospheric conditions are favorable for the artificial drying of salted codfish, simply draw lines at points corresponding to the actual wet and dry bulb temperatures of the atmosphere. If the point of intersection falls within zone A, drying is not recommended because the fish will be cooked in the dryer. Drying will take place at a rapid rate in zone B, at a slower rate in zone C because the relative humidity is above 55 percent, and at a very slow rate in zone D because of the even higher relative humidity. Sliming may be encountered when attempting to dry light-salted codfish at points falling within zone D. Drying in zone E is impossible because the dew point of the air is above 65°F. Zone F, however, is a place in which drying is always possible even though the outside humidity is very high.

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 ABSTRACTER: Martin Heerdt

5.112

DRY CARRIER FOR FAT-SOLUBLE VITAMINS

NOPCO Chemical Company (October 29, 1953)
Chemical Abstracts 47, No. 9, 4522 (1953)

British Patent No. 681,930

Superior stabilization of vitamin A in a dry carrier prepn. was accomplished by melting 18.05 parts esparto wax (m. 70-5°) and 8.02 parts hydrogenated fish oil (m. 65°) at 80°. To this was added a mixt. of vitamin A concentrate 5.42, polyoxyethylene sorbitan monopalmitate 9.71, wheat-germ flour 17.6, butylated hydroxy anisole 0.36, and soybean lecithin, 0.89 part, all of which were preheated to 80°. By a centrifugal process, the hot liquid was transformed into small solid spheroidal particles which were dusted with 1 part wheat-germ flour for each 20 parts of particles. The product was used for stock and poultry feeds and for foods.

British Patent No. 681,931

A stable dry carrier of vitamin A was prepd. by melting 22.5 parts microcryst. wax (m. 88-90°), mixing therewith fish-liver oil 30, ground expeller soybean meal 20, nordihydroguaiaretic acid 0.13, and soybean lecithin 0.33 part. Small spheroidal particles were formed by a centrifugal process, and 40 parts particles were mixed with 42 parts expeller soybean meal. Mixing of the product with a vitamin A-destroying mineral mixt. for 2 months at 37° in contact with the atm. gave no loss in potency.

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3.60

CHEMICAL AND HISTOLOGICAL PROPERTIES OF DEHYDRATED MEAT

Doty, D. M.; Wang, Hsi; and Auerbach, Earl (American Meat Institute Foundation and Department of Biochemistry, University of Chicago, Chicago)
Journal of Agricultural and Food Chemistry 1, No. 10, 664 (August 5, 1953)

The dehydrated meat that was produced commercially during World War II was satisfactory only because of the necessity of transporting and storing maximum quantities under adverse conditions. These dehydrated meats lost thiamine, pantothenic acid, and flavor during drying, but the biological value of the protein remained unchanged. Storage in airtight containers resulted in a further loss of thiamine and the development of undesirable flavors. All of the production was in the form of cooked, ground, dehydrated meat.

Before attempting to produce more palatable meats the authors decided to investigate some of the basic histological changes that occur in beef muscle tissue during drying and rehydration. When they dried slices of raw or cooked beef under vacuum at 65°C., or in air at 70°C., a reduction in muscle fiber diameter occurred, the longitudinal striations disappeared, the distinctness of cross striations decreased, the individual fibers merged, and the potassium present migrated to the periphery of the muscle fibers. These dehydrated samples were very difficult to rehydrate.

The authors also discovered that the grade assigned to a carcass and the amount of aging provided prior to drying had almost no effect on the moisture relationships or the muscle fiber diameter of raw Biceps femoris and Rectus femoris. When they subjected the cooked beef to electrolysis prior to drying, however, the resulting product could be dried to less than 15-25 percent moisture and rehydrated to 45-65 percent moisture (Table I).

(over)

 ABSTRACTER: Martin Heerdt

ANTIOXIDANT TREATMENT OF FROZEN FISH

DRY CARRIER FOR FAT-SOLUBLE VITAMINS

ARTIFICIAL DRYING OF SALTED COD

DEHYDRATED MEAT

3.60

Nonelectrolyzed cooked samples, by comparison, could be dried only to 15–25 percent moisture and rehydrated only to 25–35 percent moisture. Beef precooked at 140°, 170°, and 200° F. in a beef tallow bath but not electrolyzed prior to dehydration at 70°C. in air, or at 45°C., under vacuum, gave products similar to those obtained by drying raw beef.

Completely frozen-dried slices of raw beef or partially frozen-dried slices finished at 45°C. under vacuum gave products that could be almost completely rehydrated (Table 2). These products exhibited almost complete return to normal histological form. Migration of potassium did not occur when moisture was removed from samples in the frozen state or during reconstitution of freeze-dried samples.

Table I. Moisture Content and Muscle Fiber Diameter of *Rectus femoris* from Unaged Carcasses of Different Grades

(From Wang *et al.* (20))

	Carcass Grade					
	Prime		Good		Commercial Cow	
	Moisture, %	Fiber diameter, microns	Moisture, %	Fiber diameter, microns	Moisture, %	Fiber diameter, microns
Raw, untreated	71.3	33.7	75.4	36.7	73.6	38.8
Electrolyzed	72.2	38.2	79.0	35.9	76.2	46.1
Dehydrated	−12.1[a]	21.5	−35.0[a]	23.6	−19.0[a]	29.0
Rehydrated	60.6	25.2	81.1	28.3	78.0	35.4

[a] Negative values probably are result of solids loss during electrolysis treatment.

Table II. Moisture Content and Muscle Fiber Diameter of *Biceps femoris* Samples After Different Treatments Involving Freeze-Drying

(10 or more samples for each treatment)

Treatment	Moisture, %	Fiber Diameter	
		Core, μ	Periphery, μ
1. None	73.7	35.2–37.8	35.2–37.8
2. 3 hours freeze-drying	7.7–37.0	34.9–36.6	21.5–25.0
3. 3 hours freeze-drying, 3 hours at 45° C.	−4.3[a]–6.5	22.8–31.1	20.7–24.5
4. 9 hours freeze-drying	−5.5[a]–4.0	...	23.7–26.5
5. Rehydrated (3)	49.3–71.4	28.0–34.2	32.1–37.8
6. Rehydrated (4)	59.1–62.1	...	33.1–40.4

[a] Negative values indicate greater weight loss than that obtained on duplicate sample ground and dried for 16 hours at 65° under vacuum.

3.249 (Cross Reference: 4.61)

3.7 (Cross References: 1.5, 3.5)

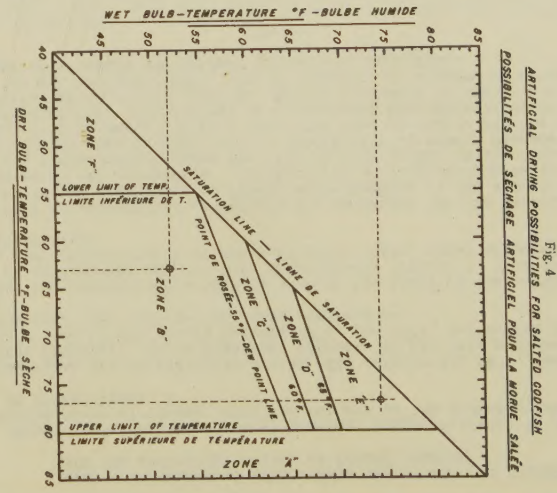

Fig. 4

3.17 SUBSTANCES ADDED TO ICE FOR KEEPING FISH FRESH

Kreuzer, R.
Fischw.- u. Feinkostind 24, 137-139 (1952)

Two papers on the subject are quoted; one is a thesis by W. Blume (Giessen, 1951) on the addition of Foromycen to ice, and the other is a review by Partmann. Foromycen is a German synthetic antiseptic, made by Petrosinlaboratorium, Ottersaach, Glucksburg a.d. Ostsee. When added to ice in a concentration of 0.05%, it is said to have good bactericidal properties; but much more experience is required with regard to its action on fish flesh and on the flavour of fish before it could be recommended for general use. Carbon dioxide, hydrogen peroxide, acridine, nitrite, formalin, etc., are mentioned briefly as potential preservatives which might be added to ice.

(The above abstract appears in Food Science Abstracts 25, No. 4, 398, July, 1953 and is reprinted here)

3.238 PAPER CUP CONTAINERS

Rosapepe, Joseph S. (Field Research Division, Paper Cup and Container Institute, Inc. New York)
Fishing Gazette 69, No. 13, 178, Annual Review Number (1952)

Wide utilization of round, nesting paper containers has occurred in recent times because of the variety of sizes and shapes in which they are available and their easy disposability. They are used both at processing plants and at retail levels.

The variety of paper containers available to take care of seafood packaging problems is unusually large since many types have already been developed for use in the dairy and meat industries which are confronted by similar problems in connection with perishable products that must be packaged in consumer sizes.

Round paper containers with window lids of cellophane have been used advantageously for lobster, shrimp and other seafood items where the visibility of the product in a refrigerated counter attracts the attention of shoppers and influences "impulse" buying.

Development of a wide variety of "send out" containers has made possible "take home" and "carry out" promotions by seafood restaurants and delicatessens and expansion of grocery and supermarket handling of fish and seafood products.

In addition to take-out orders for home use, restaurants and delicatessens are often called upon to fill multiple or bulk orders for chowders and various other seafood dishes. Many of these orders come from groups holding meetings or parties. As much as 2 quarts of lobster, crabmeat or shrimp salad and clam chowder and oyster stew in pint and quart containers is often ordered.

 ABSTRACTER: Kathryn L. Osterhaug

3.33 NEW PROCEDURES FOR EVALUATING THERMAL PROCESSES FOR FOODS IN CYLINDRICAL CONTAINERS

Stumbo, C. R. (State College of Washington, Pullman)
Food Technology 7, No. 8, 309-315 (August, 1953)

During a thermal process, the heating of a conduction-heating food in a container becomes progressively more severe as the wall is approached. Stumbo, 1948, describes this gradient of severity by picturing a series of imaginary nested containers inside the real container.

Ball, Olson, and Boyd recommend that the surface of these imaginary containers be considered to be an iso-F-surface. F as used here refers to the effectiveness of a heat treatment in terms of its capacity to reduce the number of a particular kind of bacteria in minutes at 250°F. The foregoing recommendation has been adopted. That any surface which is iso-F also is iso-j becomes immediately apparent upon inspection of the following equation presented by Ball, 1923, for calculating process time. $B_B = f_h \log jI/g$ (1) For all points in a container of conduction-heating food subjected to a specified heat process, B_B, I, and f_h are invariant. The value of F depends on the value of g attained during processing. Since g can vary only as j varies, any heating which is iso-F is by necessity also iso-j.

Accurate evaluation of the capacity of a heat process to reduce the number of bacteria in a container of food can be accomplished only if all points in the container are considered. The possibility of describing iso-j-regions within the container simplifies the task of evaluation. These regions may be described by the equation developed by Olson and Jackson, 1942, which follows: $j = j_c J_o (R_1 r/a) \cos \pi y/2b$ (2) In this equation $j = j$ at any designated point in the container, $j_c = j$ at the geometrical

(over)

 ABSTRACTER: Martin Heerdt

3.18 THE PROBLEM OF SLIME IN THE SANITATION OF FISH PLANTS

Castell, C. H. (Atlantic Fisheries Experimental Station, Halifax, N. S.)
Fisheries Research Board of Canada, Progress Reports of the Atlantic Coast Stations, No. 56, 5-9 (July, 1953)

One of the most unusual characteristics of fish is the slimy mucous secretion that covers their skin. This slime has much to do with the spoilage of fish. It provides a sticky surface to which bacteria may adhere even as the fish swims through the water. The bacterial population of this slime varies from a few bacteria to many thousands per square inch of surface. Once the fish is landed, the slime picks up contamination from every surface with which it comes in contact. Furthermore, the slime serves as a highly nutritious substance for the growth of bacteria. By actual count, salmon slime which contained 370 bacteria per ml. when the fish was landed had increased to 1950 bacteria after 2 hours at 62°F. and to 3,900,000,000 bacteria after 24 hours at 62°F.

Fish slime on well iced fish is very tenacious and difficult to wash off during the first 4 or 5 days after the fish have been landed. During this period it usually becomes heavily laden with bacteria and serves as the principal means by which fish-spoilage bacteria are carried into the fish plant. Fish slime contaminates boxes, cutting boards, conveyor belts, knives, the hands of the workers, and almost everything throughout the plant. And until the problem of continuous contamination by an endless quantity of slime-laden fish has been overcome, very little can be done to improve sanitary conditions.

The most logical solution is to avoid carrying slime onto the fish cutting tables right at the start of the operation. Thorough washing immediately after the fish enter the plant usually will solve the contamination problem, but even washing can be difficult.

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 ABSTRACTER: Martin Heerdt

ANTISEPTIC ICE

PAPER CUP CONTAINERS

THERMAL PROCESS EVALUATION

FISH SLIME AND SANITATION

3.238 (Cross Reference: 2.43)

3.18 (Cross Reference: 2.3)

The slime on fish that have been iced for 5 or more days is usually swollen, no longer sticky, and easy to wash away with a strong spray of water. The slime found on fresh fish, however, is more tenacious and requires either brushing or other abrasive action in conjunction with sprays of water (a fish washer) to remove it.

This difference between freshly-caught fish and iced fish was clearly demonstrated a few years ago in some trials at two different fish plants. In one plant all fish were transported in boxes and dumped directly onto the conveyor belt. At the other plant the fish were transported in flumes containing running water. To bring out the difference between fillets from the two plants, a record was kept of the age of the fish (days after capture) and the number of bacteria found on fillets taken from the cutting line. According to Table II, below, the number of bacteria transferred from the slime to the fillets increased with the age of the fish regardless of the handling method. However, after the 4th day the number of bacteria on fillets from fish that had been flumed in water decreased sharply. This decrease resulted from the slime becoming more easy to remove by washing.

Age of round fish in days	Average bacterial count per gram of fillet	
	Fish transported in water trough	Fish transported in wooden boxes
1	58,000	76,000
2	117,000	340,000
3	710,000	310,000
4	1,200,000	380,000
5	28,000	1,300,000
6	35,000	2,900,000

3.33 (Cross Reference: 0.6)

center of the container, $J_o(x)$ = zero order Bessel function of x, R_1 = the first positive root of $J_o(x) = 0$ or a constant 2.4048, r = distance of the designated point from the vertical axis of the container, a = radius of the container, y = distance of the designated point above or below a horizontal plane bisecting the container, and 2b = container height.

By using equation (2) a number of iso-j-regions, from the center to the wall of a No. 10 (603 x 700) can of a conduction-heating food product, were described and depicted graphically in Figure 1, omitted, on a plane bisecting the container through its longitudinal axis. Each trace on the plane represents an iso-j-region of infinitesimal thickness, the enclosed volume of which may be determined graphically by using elementary mathematics. The F value characterizing the heat treatment received may be calculated by the equation of Ball, 1923, 1928, $F = f_h/(f_h/U)F_1$ (3) in which the j value of the cooling curve was considered to be 1.41.

To describe the death of bacteria as occurring with minutes of exposure to a constant temperature, Stumbo, 1948, presented the equation U = D (log a - log b) (4) in which U = time of heating, D = time to kill 90 percent of the cells, a = initial number of viable cells, and b = number present after heating time U. Rearrangement of equation (4) gives an expression equal to the fraction of cells remaining viable after heating time U, of $b/a = 1/\log^{-1} U/D$ (5). The expression of U as its equivalent in minutes at 250°F. permits equation (5) to become $b/a = 1/\log^{-1} F/Dr$ (6).

If uniform contamination of a food product with bacterial spores of known heat resistance is assumed, the use of equation (6) will permit the fraction surviving in any iso-j-region of a container to be calculated. Plotting these surviving fractions on plain coordinate paper against the number of spores enclosed by the iso-j-regions yields a curve that divides the total area according to the number of spores surviving. The area beneath the curve when determined with a planimeter will indicate the number of spores surviving per thousand containers. A relatively simple mathematical procedure for obtaining the number of survivors may also be developed.

2.8 PREPARATION OF SALADS WITH FISH AS A BASE

Biegler, P.
Fischw.- u. Feinkostind. 24, 49-53 (1952)
Wld. Fish. Abstr. 3, No. 6, 29 (1952)

Recipes are given for large-scale preparation of a wide variety of fish salads. Salted and acid-cured herring and sprat are used in most of the salads; but other fish and fishery products may also be used,e.g. salted herring milt, cooked flesh of lobster, crab, white fish, and acid-cured white fish. The salads are prepared by mixing small pieces of fish with cut fruits, cut acid-cured vegetables, and a spiced dressing. The vegetables include red beets, celery, cucumbers, beans, carrots, potatoes, and peas; they are pre-treated by boiling and by curing in a brine containing 2 to 3% of salt and 3% of acetic acid. Ham and other preserved meats are included in some of the salads. The dressing is oil and vinegar or a mayonnaise with a low fat content (prepared with Milkamin as a stabilizer) which is of good keeping quality. Spices, tomato ketchup, etc., are mixed into the dressing. The fish, fruits, and vegetables may be cut into small cubes with the Baader machine. A mixture of preservatives, in a concentration of about 0.15%, is added to the salad.

(The above abstract appears in Food Science Abstracts 25, No. 4, 395, July, 1953 and is reprinted here)

2.19 COMPETITIVE QUALITY BEGINS ON THE BOAT

Harvey, E. W. (Director, Oregon Seafoods Laboratory, Astoria, Oregon)
Pacific Fisherman 51, No. 9, 35, 37 (August, 1953)

The most vital factor in expanding the market for seafood is to make more satisfied consumers of seafood. More people would eat fish regularly if they could be sure that all of the fish they bought was in the best of condition.

Fish are among the most perishable of foods. Spoilage is due to three activities: (a) autolysis or self-digestion; (b) oxidation (rancidity); (c) bacterial growth. By far the most important of these for producing undesirable changes in flavor, odor and appearance in fish is bacterial growth. The marine bacteria responsible for spoilage in fish, unlike those for most foods, grow rapidly at a temperature just above the freezing point of water.

Realizing the importance of these factors it is easy to see how some handling practices at sea tend to accelerate these processes. Some of these practices are enumerated as follows:

(1) Inadequacy of chilling procedures. Chilling is often delayed during heavy catch periods and there is often not enough ice on board in which to pack the fish adequately and to keep them effectively until the boat docks. Lack of insulation makes uniform temperatures within the hold impossible and the fish nearest the deck and bulkheads are not adequately chilled. It has been estimated that heat transfer in noninsulated holds causes as much ice wastage during a week's voyage as that required to chill the fish.

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 ABSTRACTER: Kathryn L. Osterhaug

3.19 BREAKING THE HEAT BARRIER

Anonymous
National Provisioner 129, No. 7, 12-14 (August 15, 1953)

How to attain sterility in canned meats without sacrificing flavor and texture through excessive cooking heat is the aim of several research projects.

One of the major disadvantages of current steam retorting, as well as of all conductive heat processing, is the necessity of applying heat to the outside of a product for a long enough period to permit the center to reach a desired processing temperature. This long exposure to cooking temperatures unavoidably results in over-cooking of the outer perimeter long before inside temperatures have reached a satisfactory processing level. For example, it is impossible to produce a sterile canned whole ham by present methods because such severe heating would reduce the outer perimeter to mush before the core could be satisfactorily processed.

The object of the experiments with dielectric heating being carried on by the American Meat Institute Foundation cooperating with the Quartermaster Food and Container Institute in laboratories at the University of Chicago is to produce canned products not possible by conventional processing methods.

In the dielectric heating process the product to be cooked is placed between two plates or poles. These plates are then charged with a high-voltage, rapidly alternating (9 million times per second) electrical current. Polar molecules of the product, having positive and negative ends, attempt to keep in alignment with the rapidly alternating positive-negative charge at the plate and, in so doing, release energy in the form of heat. The product is thus forced to heat itself and every part is heated at the same time and at

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 ABSTRACTER: Kathryn L. Osterhaug

3.13 NEW FISH PRESERVATIVE

Anonymous
Canadian Fisherman 40, No. 8, 24 (August, 1953)

A new process for the protection of fish against oxidation and rancidity and for the destruction or inhibition of microorganisms is currently being tested at one of Canada's Fisheries Experimental Stations. It is called the Dunkley Process.

The patented apparatus operates under specific conditions but is said to be conveniently adaptable to plant equipment. It burns natural or tank gas and, by means of controlled combustion, produces a mixture of gases known as Dunkley Gas, which has strong antioxidizing properties.

The gas is used at a specific pressure, at a specific temperature, and for a specific time which varies with each food product treated. It can be bubbled through liquids or diffused through semiporous foods. After use the gas can be saved, re-scrubbed, regenerated and re-used.

Kept under a blanket of Dunkley Gas at 32-33°F., high-quality fish is said to improve in color, and to keep well without becoming slimy or developing objectionable "fishy" or oxidized flavor for as long as one or two months.

Best results are obtained with high-quality fish. The process does not replace heat treatment or refrigeration but it does extend the upward range of temperatures in heating and refrigeration.

 ABSTRACTER: Roy C. Stevens

PREPARATION OF FISH SALADS

DIELECTRIC HEAT PROCESSING

HANDLING FRESH FISH AT SEA

GASEOUS PRESERVATIVE FOR FISH

3.19

essentially the same rate.

The uniformity and rapidity of processing are the major attractions of the high frequency dielectric process. If it could be applied on a commercial basis these two factors would terminate over-cooking and uneven cooking of the product with material benefit to flavor, texture and nutritional value.

The big problem is to adapt the process to line production requirements for use on a commercial scale. It has already been demonstrated that dielectric methods can be used for satisfactory processing of meat products including pork luncheon meat and boned, cured whole ham. In addition, dielectric heating has been used to defrost frozen pork bellies in less than a minute, in strong contrast with the 18 to 24 hours required by current commercial procedures.

Although these accomplishments demonstrate that great technological progress has already taken place, there are still a number of technical problems to be solved before the process can be adapted for universal use. Calculations indicate that with the present equipment only 55 to 58 percent of the electrical energy introduced at the oscillator is recovered as heat in the meat and processing cell. Efforts are being made to increase the efficiency, possibly up to 75 percent.

One of the most difficult problems arises from the fact that polar molecules cannot be made to give off heat when they are sealed in a tin can. There are now two possibilities for solving this problem. One is to devise a satisfactory consumer container made of non-conductive material and equipped with metal ends or inserts that could serve as poles during processing. The other possibility would be to utilize a continuous processor designed to cook the product and then to extrude it -- either directly into cans or in a manner that would facilitate transfer into containers.

The final over-all factor will, of course, be the matter of equipment and operating costs.

2.19

(2) Unsanitary practices. Regardless of construction materials used, scales, viscera and blood collect in the holds and on the decks of fishing vessels. Cleaning and scrubbing with cold sea water is helpful but not thorough. Often the decks are not completely cleaned of gurry before a fresh catch is hauled in and the fish themselves may not be thoroughly washed after dressing or before going into the hold. The construction of the hold is often such that the ice water containing slime, blood and bacteria drains down through and contaminates many layers of fish.

(3) Rough handling. When forks are used for repeated transfers each individual fish accumulates several holes. The holes form ports of entry for spoilage bacteria and also may result in unsightly red spots in the flesh. Bruising is another common occurrence. It causes softening, discoloration and rapid spoilage. This damage is often caused by excessive pressure in the pens, jagged pieces of ice, rough weather, walking through the fish on deck or in the hold and letting fish drop from the hatch to the hold floor. Excessive depth of stowage causes both bruising and loss of weight.

4.60 KINETIC STUDY OF THE ACTION OF ANTI-OXIDANTS

Dubouloz, P.; Laurent, J.; and Jouve, G.
Oleagineux 7, 265-271 (1952)

It has been shown previously that the autoxidation of lipids is autocatalytic (established by Bolland on methyl linoleate). It has further been postulated that anti-oxidants act on peroxides, with mutual destruction by the 2 reactants. The authors investigated this hypothesis with autoxidized ethyl oleate and tocopherol, and proved that tocopherol did not significantly destroy existing peroxides, but that it prevented peroxide formation. It is assumed that tocopherol acts on unstable compounds preceding peroxides. The kinetics of the reactions involved are considered mathematically. It is pointed out that although tocopherol does not exert its anti-oxidant power by reaction with peroxides, other anti-oxidants probably do act in this way, and preliminary observations showed that animal and vegetable tissues rapidly destroy peroxides by a reaction which is apparently non-enzymic; this property is especially characteristic of oil-seed cakes.

(The above abstract appears in Food Science Abstracts 25, No. 4, 421, July, 1953, and is reprinted here)

3.26 DRY ICE REFRIGERATION FOR TRUCKS

Anonymous
Ice and Refrigeration 125, No. 2, 52 (August, 1953)

Tests to determine the ability of one type of dry ice refrigeration system to hold frozen foods at or near loading temperatures during transit have been conducted by the Production and Marketing Administration of the Department of Agriculture.

A dry ice bunker was installed in a 32-foot-6-inch tandem semi-trailer with 6 inches of fiberglass insulation in the walls, flooring and ceiling. Outside sheathing was aluminum and inside sheathing plywood. The inside walls of the trailer were stripped vertically with wooden slats, 2 inches wide and 7/8-inch thick, spaced 6 inches apart. Floor racks of 1 by 3 inch lumber allowed a space of slightly more than 2 inches for the circulation of air underneath the load and five 2 by 1 5/8-inch wooden strips, spaced 6 inches apart, were nailed vertically to each of the rear doors.

A small door was installed in the curved surface of the right side wall adjacent to the nose of the trailer to permit access for icing. Heavy canvas curtains were provided at the rear of the trailer to minimize loss of refrigeration during loading and unloading operations.

The basic unit of the dry ice system of refrigeration was a welded aluminum ice bunker with a capacity of about 900 pounds of dry ice. The unit consisted of finned exterior surfaces, supported by a welded steel frame and enclosed by an outer steel housing. The dry ice was placed on three 1/4-inch aluminum shelves which were welded to the exterior fins to provide maximum conduction of heat. The shelf compartments were sealed by a gasketed accessdoor

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 ABSTRACTER: Kathryn L. Osterhaug

4.11 THE GLYCERIDE STRUCTURE OF NATURAL FATS. I. A TECHNIQUE FOR THE QUANTITATIVE DETERMINATION OF GLYCERIDE TYPES IN NATURAL FATS

Kartha, A. R. S. (Maharaja's College, Ernakulam, India)
Journal of the American Oil Chemists' Society 30, No. 7, 280-282 (July, 1953)

A systematic investigation of the natural fats was first undertaken by Hilditch and his colleagues. Among their many contributions was an oxidative method for the quantitative determination of GS_3 (G equals the glyceryl radical and S equals the saturated acid group). A modification of this procedure forms the basis for the present method of determining the four glycerides GS_3, GS_2U, GSU_2, and GU_3 (U equals the unsaturated acid group).

There have been several attempts to determine the GS_2U, GSU_2 and GU_3 components of natural fats. None has been entirely successful.

Kartha, during attempts at separating the products of fat oxidation according to the Hilditch method of preferential extraction with bicarbonate, found that the azelaoglycerides formed in the reaction were partly destroyed by hydrolysis. He then developed the acetic acid-acetone-permanganate method of oxidation and the azelaoglyceride separation method that is described in this paper. These procedures are the basis of the method for quantitative estimation of the glyceride types, which is also described.

The acetone-permanganate oxidation method for determining GS_3 was found to be unreliable. The reason is that some hydrolysis of the azelaoglycerides occurs, and the products of this reaction are determined as GS_3. The presence of excess acetic acid

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 ABSTRACTER: F. Bruce Sanford

4.11 THE GLYCERIDE STRUCTURE OF NATURAL FATS II. THE RULE OF GLYCERIDE TYPE DISTRIBUTION OF NATURAL FATS

Kartha, A. R. S. (Maharaja's College, Ernakulam, India)
Journal of the American Oil Chemists' Society 30, No. 8, 326-329 (August, 1953)

Hilditch and his coworkers have done extensive work on the distribution of the constituent fatty acids in fats. They have discovered that some fats conform approximately to what they call the rule of even distribution.

The author of the present paper has shown that the glyceride-type composition of a natural fat can be calculated from the total mol percent of saturated fatty acids and the total mol percent of trisaturated glycerides, in accordance with a new rule of glyceride-type distribution.

With "G" symbolizing the glyceryl radical and "S" the saturated fatty acids, this new rule can be stated as follows:

"The glyceride-type composition of any natural fat is that obtained by interchange, according to chance, of one-third of the saturated acids represented by the difference between the GS_3 content required by chance and that actually present with the unsaturated acids in the fat, without allowing the formation of any further GS_3."

 ABSTRACTER: F. Bruce Sanford

4.11

throughout the oxidation corrects this defect. GS_2A (A equals azelaic acid group) can be precipitated quantitatively as the magnesium salt. Although it is contaminated with GSA_2, its proportion can be calculated, and from this the proportion of GS_2U in the sample can be found.

The remainder of the precipitate is GSA_2, which when added to that found in the filtrates, gives the total GSA_2. From this the amount of GSU_2 in the sample can be derived. The GS_3 can be determined separately, and the content of GU_3 can be estimated by difference.

3.26

so that the dry ice would not come into contact with the air in the cargo space. Carbon dioxide resulting from the sublimation of dry ice could be released either into the cargo space or to the outside by means of appropriate valves.

The circulation of air in the trailer was provided by two blower fans located above the bunker. One fan operated continuously, drawing the air through a bypass in the unit. The other fan, pulling the air from under the floor racks, passing it over the finned surface of the bunker where it was cooled, and then distributing it over the load, cycled on and off automatically from the setting of the thermostat.

The only moving parts in the system were the two blower fans electrically operated from the tractor battery. For lay-overs, an accessory transformer was available for connection to any 110-volt a.c. power source.

In the preliminary 24-hour performance test it was found that 18 hours were required to reduce the inside temperature of the trailer from 57° to 0°F. The ice consumption rate was about 33 pounds per hour.

The transit test from Auburndale, Florida to Philadelphia, Pennsylvania covered 72 hours. The system was re-iced three times during the trip and total consumption of dry ice was 1,788 pounds at a cost of $55.42. The average temperature of the load at the beginning of the test was -4.2°F. in comparison with an average of -1.9°F. at the end of the test. The average temperature at the bottom of the load was consistently lower than the average temperature at the top of the load.

0.6 REPORT ON THE WORK OF THE MICROBIOLOGICAL DEPARTMENT OF THE CHEMICO-TECHNICAL RESEARCH INSTITUTE OF THE FISHERY DIRECTORATE, 1937-42

Anonymous
Arsberetn. Norg. Fisk. 1945, No. 3, (1951)

The name of the Department of Bacteriology (established in 1932) was, in 1939, changed to Department of Microbiology. Its work includes technological fishery research, fundamental biochemical and microbiological research, and consultative activities. The investigations reported were concerned with: herring brine; treatment of coalfish fillet with acetic acid; transport and storage of live fish; treatment and transport of fresh shrimps; chitin-splitting bacteria from shellfish (and the transport and storage of shellfish); determinations of volatile nitrogen, ammonia nitrogen, and trimethylamine nitrogen in fish meal and salted fish; Sarcinae on the surface of klip-fish; transport of mackerel; storage of whale meat; chemical and bacteriological examinations of raw fish; food spoilage; collection of pure cultures and enrichment cultures of micro-organisms; the use of electrometric methods of pH measurement in fish and fish products; the physico-chemical examination of raw fish and their organs; dissociation exponents of weak and medium-strong acids; substrate for the culture of halophilic micro-organisms; and the growth of Saccharomyces ellipsoideus in nutrient solutions with various contents of cooking salt.

(The above abstract appears in Food Science Abstracts 25, No. 4, 404, July, 1953 and is reprinted here)

1.0111 MANITOBA'S BULLHEAD FISHERY

Butler, M. E.
Canadian Fisherman 40, No. 8, 19 (August, 1953)

The bullhead fishery of Manitoba now produces over 200,000 pounds of skinned bullheads each year. The fishery is centered in the Delta waters of the Red River, which flows northward from Minnesota and North Dakota through Manitoba and finally into Lake Winnipeg.

One tributary to the waters of the Delta is known as Wavey Creek, a stream containing several springs in its bottom. The springs are apparently very attractive to bullheads, and there is a portion of the creek, approximately a mile and a half in length and varying from 100 to 400 feet in width, where the catfish are taken in particularly large numbers during the milder weather of the winter fishing season. Four-and-a-quarter-inch nylon gill nets from 40 to 50 fathoms in length are used for this fishing. In some places the creek is so shallow that a net depth of only about 18 inches is required. When the run is at its peak, a half ton or more of bullheads will be taken from one gill net. A day's catch may be anywhere from 2 to 3 tons.

Each fishing team is made up of 4 men using a tractor-drawn sleigh and caboose. The nets are pulled from the water onto the ice a short length at a time and cleared of fish as rapidly as possible before the nets freeze. Late in the afternoon of each day the catch is hauled to the processing plant where the fish are skinned and dressed and packed in twelve-ounce or one-pound packages ready to cook.

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 ABSTRACTER: Roy C. Stevens

0.7 SOYIN, A PROTEIN IN RAW SOYBEANS

Anonymous
Nutrition Reviews 11, No. 8, 253-254 (August, 1953)

Soyin is a protein that has certain toxic properties. It was recently isolated from defatted soybean flour by I. E. Liener and M. J. Pallanoch (1952). Soyin can be inactivated by heating the soybeans. I. E. Liener (1953) recently learned to what extent soyin is responsible for the poor nutritive value of unheated soybean oil meal. He did this by feeding an isolated soyin preparation containing about 78 percent of the toxic protein to weanling male rats. This preparation showed very little antitryptic activity, but had a marked hemagglutinating action.

The ration fed contained either 25 percent raw defatted soybean flour, or 25 percent casein; 4 percent salt; 6 percent corn oil; and 65 percent sucrose. It was supplemented with a complete vitamin mixture. The ration was improved by the addition of 0.6 percent DL-methionine when soybean flour served as the protein.

Control rats received the same diet except that autoclaved soybean flour was used in place of raw soybean flour. After two weeks of feeding, rats on the raw flour ration had gained only 20 grams, whereas rats on the autoclaved flour ration had gained 43.8 grams. Soyin added to the autoclaved flour ration at a level of 1 percent permitted similar rats to gain only 45 grams, whereas the controls gained 64 grams. When soyin was added to the casein-containing ration a similar although less marked growth retarding action was recorded. The author concludes, therefore, that about 1/2 of the growth-depressing effect of raw soybean diets could be due to the presence of soyin.

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 ABSTRACTER: Martin Heerdt

2.08 RECENT EXPERIMENTS SHOW VALUE OF FLAKED ICE FROZEN FROM SALT WATER

Field, Crosby
Fishing Gazette 70, No. 8, 54-55 (August, 1953)

The advantages of using salt water ice instead of fresh water ice to preserve fish are said to have been demonstrated in a pilot plant study conducted jointly by a Florida fish company and a New York ice company.

Subcooled, flaked salt water ice was taken from the refrigerated bin in the shore plant, in which it had been stored for as long as five weeks, and placed in the "boxes" of the vessel. Despite its long storage, the ice was easily handled and the flakes showed no tendency to stick together. Only those flakes in contact with the warm sides of the ice boxes were found to fuse together, and these formed a thin crust under which the ribbons of ice remained soft and easy to handle.

Immediately after having been caught and dressed, fish were divided into lots. Some lots were iced with flaked salt water ice and others were iced with ordinary crushed fresh water ice. In each case the fish iced with the salt water ice flakes were said to be superior in appearance, color, brightness of eyes, firmness of flesh, and to have substantially no slime.

The flesh temperatures of the fish were found to average six degrees lower than temperatures of fish iced with crushed ice. The temperature of the salt-iced fish ranged from 30° to 32°F. Air temperatures during the tests sometimes exceeded 100°F. The fish used in the experiments were red snappers, skipjack, shrimp, and small lots of other species.

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 ABSTRACTER: Roy C. Stevens

REPORT ON NORWEGIAN MICROBIOLOGICAL WORK

GROWTH-RETARDING EFFECT IN RAW SOYBEANS

MANITOBA'S BULLHEAD FISHERY

FLAKED SALT WATER ICE

0.7

When trypsin was added at the 5 percent level to the raw soybean flour ration, rat weight gains with and without trypsin at the end of two weeks were 49 and 24 grams, respectively. The control rats, meanwhile, gained 66 grams on the autoclaved soybean flour ration. The remaining 1/2 of the growth-retarding effect, therefore, appears to be due to factors that can be overcome by the addition of trypsin.

A soybean trypsin inhibitor prepared by the method of A. A. Klose, B. Hill, and H. L. Fevold (1946) was also fed to rats. This preparation inhibited the growth of rats when included in the diet at a 2 percent level but not at a 1 percent level. Nonetheless, this trypsin inhibitor contained more antitryptic activity than was present in the soyin preparations. The growth-inhibiting action of the soyin, therefore, was not due to antitrypsin.

R. Borchers and C. W. Ackerson (1951) showed that crude trypsin preparations could be autoclaved at 15 pounds steam pressure for 30 minutes and still overcome the growth-retarding effects of raw soybean oil meal. The mechanism by which crude trypsin without trypsin activity improves growth in rats when added to a raw soybean diet still remains hidden.

2.08

Best temperatures for holding fish appear to be 28° to 30°F., temperatures that are readily obtainable with the salt water flaked ice without danger of "burning" the flesh. Because the salt water ice flakes melt at a uniform temperature throughout their mass, there is no chance of a low melting point ice concentrating in spots.

The thickness of the individual frozen salt water flake was found to be an important factor in the handling and storage of the ice, and in its over-all effectiveness. Results of the experiments indicate that the optimum thickness lies above one-eighth inch. The flakes were found to keep well aboard ship. Another advantage of the salt water flakes is their shape. There are no sharp points to dig into the flesh of the fish and leave markings.

A uniform distribution of antiseptics or bactericides could be obtained throughout the flakes, if desired.

Salt water ice flakes can be produced on machines formerly used in making fresh water ice flakes.

1.0111 (Cross Reference: 1.92)

Skinning is not as difficult a process as it might sound. First, the skin is cut through behind the head. The fish is then impaled by the head on a nail and the skinner, with a simple twist of a pair of pliers, turns the loosened skin and pulls it down over the tail. In this process the greater part of the entrails are removed and then the fish is passed to the filleting table where another fish handler beheads it and scrapes the body cavity clean.

From the filleting table the fillets pass to the weighing scale where they are weighed and packed in small cartons. When packed, the cartons are taken to the freezer where they are quick-frozen between pressure plates. The packages are then stored or shipped to market.

Manitoba's bullhead fishery produced 290,200 pounds in 1952, the market value of which was $85,219.

0.6 ANNUAL REPORT, 1949, OF THE CHEMICO-TECHNICAL RESEARCH INSTITUTE OF THE FISHERY DIRECTORATE

Notevarp, O.
Arsberetn. Norg. Fish., 1949, No. 8 (1951)

The Director, O. Notevarp, gives a general report on the work of his Institute. This is followed by more detailed reports upon: A.1. Analytical chemistry, by F. Villmark (pp. 17-18), 2. Microbiology, by S. Hjorth-Hansen (pp. 19-20), and 3. Chemistry of fats, by L. Aure (pp. 20-22); B.1. Cooling and freezing, by O. Karlsen (pp. 23-27), 2. Dried and salted products, by Y. Gilbert (pp. 27-29), and 3. Processing, by K. Bakken (pp. 29-32). A report on a special investigation, by J. W. Jensen (pp. 22-23); on plant and equipment, by E. Sola (pp. 32-35), and on vitamin research, by O. Braekkan (pp. 36-37), are also included.

Problems being studied include the following: the cause of the increase in fatty acids in some herring oils during storage, and means of preventing it; a new method of determination of water in oils and fish products by means of infra-red rays; determination of protein, fat, and mineral substances in fresh, smoked, and salted herring and other fish.

Experiments were carried out on: (1) storage of fresh fish (herring and cod) at 0°, 6°, 10°, and 20°C., and the influence of preliminary washing of herring in sea-water and in fresh water and the keeping quality of whole and of gutted mackerel, a freshwater fish (Lucioperca sandra), which does not contain trimethylamine oxide, being stored on ice for comparison. A new processing method for obtaining cod liver oil is being developed.

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(The above abstract appears in Food Science Abstracts 25, No. 4, 404, July, 1953 and is reprinted here in part)

0.32 BIOLOGICAL VALUE OF PROTEINS

Anonymous
Food Manufacture 28, No. 8, 297 (August 1, 1953)

A. E. Bender and coworkers at The Crookes Laboratories have devised a new method for measuring the biological value of proteins. In the past the simultaneous measurement of three proteins by the classical method of Thomas and Mitchell has required 5 ten-day periods of collection, 120 analyses for urine nitrogen, and 120 analyses for feces nitrogen. The new method, by comparison, permits the simultaneous measurement of seven proteins in a 10-day period with nitrogen analyses confined to the diet only.

Bender's method requires two groups of rats for the feeding studies. The rats in Group I receive a non-protein diet for the period of the experiment, while the rats in Group 2 receive a test protein. At the end of the feeding period the carcass nitrogen of the non-protein group is subtracted from the carcass nitrogen of the protein group. The value obtained, when divided by the nitrogen fed, equals the net protein utilization or biological value multiplied by digestibility.

The discovery of a constant ratio between nitrogen and water in the body of the rat has eliminated the need for nitrogen measurements. This ratio is dependent only upon the age of the rats. Once the experiment has terminated, nitrogen may be found simply by multiplying the dry weight of the rats by the previously established ratio.

Bender's method permits large numbers of biological values to be determined with relative ease. As a consequence, problems that heretofore have required a major experiment may now be solved with a minimum of effort. For example, no one wanted to

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 ABSTRACTER: Martin Heerdt

1.017 AUSTRALIA'S CANNED FISH INDUSTRY

Anonymous
Food Manufacture 28, No. 8, 324-325 (August, 1953)

In 1939-1940, approximately 2,936,000 pounds of fish were canned in Australia. The production of canned fish has increased steadily and has now stabilized at about 12,000,000 pounds annually. Seventeen canneries have been built in Australia, in every state except Queensland. Tasmania is the largest canning state and usually produces over 40 percent of Australian production.

At Narooma, a small seaside resort on the south coast of New South Wales, a modern cannery with an annual capacity of 8 million 12-ounce cans has been in production since 1940. The Eden cannery, New South Wales, has a capacity of 150,000 4-ounce cans, 60,000 12-ounce cans, and 70,000 16-ounce cans of processed fish each week. The Eden cannery packs salmon, barracouta, tuna, whitebait, mackerel, pilchards, and minor quantities of other fish, with salmon and barracouta accounting for about 90 percent of the output.

Australian canned fish production is limited only by the catch from the fishing grounds. Inshore banks in southeastern Australia are already fished almost to capacity. However, the vast trawling grounds are undeveloped along the northwest coast of Western Australia and in the Great Australian Bight because of their great distance from the centers of population.

At the present, interests are concentrating on tuna fishing and canning. The Australian public has reacted favorably to the canned tuna, and their demand for it seems likely to rise. Samples of Australian canned tuna also have been well received in other

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 ABSTRACTER: D. T. Miyauchi

1.0141 NOTES FROM NORWAY

Whiteleather, R. T. (Branch of Commercial Fisheries, U. S. Fish and Wildlife Service, Washington, D. C.)
Pan American Fisherman 8, No. 1, 23 (August, 1953)

Norway's tuna fishery has developed to one of major importance only during the last three or four years. The species upon which the fishery depends is the large bluefin tuna which, along the central coast of Norway, seems to average from 150 to 250 pounds in weight.

Practically all of the catch is taken by means of a specially-devised purse seine. The 1952 catch totaled approximately 25 million pounds. The volume may be increased in accordance with market demands.

The fish are headed and gutted, and some are placed in frozen storage awaiting shipment to various assembly points for export. Half or more of the tuna are heavily iced and shipped by rail from Bergen to Italy. According to the author's belief, the only market at the present time for Norwegian bluefin is in Italy, where the fish are canned. So far as is known, they are not canned to any extent in Norway.

Tuna in storage during the author's visit appeared to be first-class in quality. Freezing facilities along the coast of Norway are constantly being improved and enlarged. One large freezer at Trondheim, for example, has a 3500-ton capacity. A recently completed plant at Bergen has a capacity of 12,000 tons.

Shipments of frozen tuna from Norway are handled almost exclusively by the export association Norsk Frossenfisk, with head offices in Oslo. Nearly all of the frozen fish for export, regardless of species, moves through this association.

 ABSTRACTER: Roy C. Stevens

NORWEGIAN TECHNOLOGICAL REPORT

AUSTRALIAN FISH CANNING INDUSTRY

BIOLOGICAL VALUE OF PROTEINS

NORWEGIAN TUNA FISHERY

1.017 (Cross Reference: 3.30)

countries.

In spite of recent big production increases, only about 25 percent of the canned fish on the Australian market is produced locally. With an expected increase in population to about 11 million by 1960 and a corresponding increase in demand for fishery products, the future of the Australian fishing industry appears bright.

1.0141 (Cross Reference: 1.1)

0.6

Experiments with antioxidants were carried out in the laboratory and under commercial conditions. It was found that dipping or glazing treatments, using ascorbic acid or ascorbate (with and without nitrite, sulphite, and salt) lessened or delayed the development of rancidity in various types of herring product; treatments of fresh fillet were particularly successful, but rancidity in smoked fillet could also be decreased.

The production of protein from fish waste is being investigated.

0.32 (Cross Reference: 6.195)

devote 2 months of time to determining the biological value of gelatin. Yet, gelatin, which is completely deficient in tryptophane, should have a biological value of 0 rather than 25 as is quoted in the literature. Bender and coworkers proved that gelatin has a value of 0 simply by including this measurement along with their routine work.

3.30 ESTIMATING VACUUM IN A CAN

Shiga, Iwao and Kimura, Keiichi (Oriental Canning Institute, Hyogoken, Japan)
Canner 117, No. 6, 18, 19, 44 (August 10, 1953)

A new method has been developed for estimating the vacuum of a can without puncturing it. The method is based on the discovery that the light disk produced by the reflection of light from the surface of the lid changes size in proportion to the degree of vacuum inside the can.

One lot of tuna cans (211 x 109) was filled with 95 cc. of water and seamed under five different degrees of vacuum by a semiautomatic vacuum sealer. Another lot was filled as above, but sealed under no vacuum, and connected to a vacuum gage through a special connecting apparatus and an aspirator, and then evacuated to any desired degree of vacuum.

Photographs of the cans were made actual size, and the light disk at the center of the can lid produced by a miniature electric lamp held about 121 cm. above the table was measured in millimeters. Can vacuum was determined in inches by means of a vacuum gage.

A graph accompanying the article shows an approximate linear relationship between the logarithm of can vacuum in inches and diameter in millimeters of the light disc image within the vacuum range used in the experiment (5 to 22 inches). It was found that the vacuum gage gave lower than true vacuum readings in cans that had about 12.2 cc. of head space. This may possibly have been caused by expansion of the can ends with the sudden entrance of air as the can was pierced by the vacuum gage.

Taking the above fact into consideration, a corrected curve may be approximately expressed by the equation $x = 19.4 \log y$. In general, the relation will be expressed as $x = S (\log y - \log a)$ where x = diameter of the light disk in millimeters, y = can vacuum in inches, S = slope of the curve, and a = a constant.

The success of this method depends upon the thickness and temper of the tin-plate of which the can ends are made being uniform. The surface of the tin-plate must be smooth and bright.

A method whereby can vacuum can be estimated from the intensity of reflected light is also described.

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 ABSTRACTER: Roy C. Stevens

8.64 ANIMAL PROTEIN FACTOR (APF) AND VITAMIN B_{12} IN MARINE PRODUCTS. I. AQUATIC ANIMALS

Hashimoto, Yoshiro; Yamada, Shigehide; and Mori, Takajiro
Bulletin of the Japanese Society of Scientific Fisheries 19, No. 3, 135 (1953)

Vitamin B_{12} content of the various organs of 15 aquatic animals was determined.

Table 1 Vitamin B_{12} contents in aquatic animals (Fresh basis)

	B_{12} γ%		B_{12} γ%		B_{12} γ%
Cynlas manaso		(Maiwashi)		*Katsuwonus vagans*	
(Hoshizame)		liver	(12.6)	(Katsuo)	
liver	1.8*	pyloric-appendage	(11.0)	liver	9.2
heart	3.7	heart	(6.2)	pyloric-appendage	5.4
stomach	0.8	stomach and intestine	(3.3)	heart	10.0
intestine	1.0 (1.2)**	meat	(2.5)	intestine	6.4
meat	0.1 (1.4)	testis	(1.4)	*Neothunnus macropterus*	
Trachurus japonicus		ovary	(1.5)	(Kiwada-maguro)	
(Aji)		*Pagrosomus major*		liver	17.5
liver	(31.8)	(Tai)		pyloric-appendage	2.6
pyloric-appendage	(6.2)	liver	(19.8)	stomach	1.7
heart	(6.2)	stomach and intestine	(1.8)	meat	1.1
kidney	(2.6)	meat	(0.0)	*Theragra chalcogramma*	
stomach and intestine	(3.4)	brain	(1.9)	(Sukeso-tara)	
white meat	(0.3)	*Scomber japonicus*		white meat	(0.3)
red meat	(7.8)	(Saba)		red meat	(2.4)
Dicapterus muroadsi		liver	(7.4)	*Loligo bleekeri*	
(Muroaji)		pyloric-appendage	(5.8)	(Yari-ika)	
liver	(30.0)	heart	(9.0)	liver	1.4
white meat	(0.6)	stomach and intestine	(1.0)	other viscera	1.9 (1.4)
red meat	(7.0)	white meat	(0.9)	meat	1.6 (2.1)
Sardinia melanosticta		red meat	(8.0)	eye	0.7
				Venerupis semidecussata	
				(Asari)	1.5
				Ostrea edulis	
				(Kaki)	
				liver	(19.0)
				adductor muscle	(4.8)
				others	(3.4)
				Turbo cornutus	
				(Sazae)	
				liver	(1.1)
				meat	(0.3)
				Penaeus japonicus	
				(Kuruma-ebi)	
				liver	(11.4)
				meat	(0.1)
				Stichopus japonicus	
				(Namako)	
				intestine	(1.1)
				meat	(0.5)

* On the water extract of untreated material.
** On the water extract of material digested with trypsin.

 Reprinted in part

7.874 THE APPLICATION OF THE THIOBARBITURIC ACID TEST TO THE DETERMINATION OF OXIDATIVE RANCIDITY IN FROZEN HERRING

Fridriksdottir, Sigrun
Student Report on Special Problem, Cornell University, Ithaca, New York (1953), 35 pp.

Thiobarbituric acid (hereafter referred to as TBA) reacts with oxidized oil to produce an orange red color with an absorption maximum at 532 millimicrons. Dunkley and Jennings (J. Dairy Science 34, 1064 (1951)) adapted this reaction to a spectrophotometric method for following rancidity development in milk. The author has attempted to adapt this TBA procedure to frozen herring.

A procedure was set up for determining TBA values in herring and measurements were made on minced fish stored for different periods of time at several different temperatures. It was found that whereas an increase in TBA values took place with increasing rancidification, the results were not reliable enough to warrant using the test as a quantitative measure of degree of rancidity. Values for the same degree of rancidity for meals stored at different temperatures also varied. The test is suitable as a qualitative test for rancidity of fish oils.

The report contains a nine-page preliminary section which discusses rancidity of fish, antioxidants for fish, etc. in some detail. A bibliography with 16 references is also included.

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 ABSTRACTER: M. E. Stansby

8.64 VITAMIN B_{12} IN MARINE INVERTEBRATES AND SEAWEEDS

Southcott, B. A. and Tarr, H. L. A. (Pacific Fisheries Experimental Station, Vancouver, B. C.)
Fisheries Research Board of Canada, Progress Reports of the Pacific Coast Stations, No. 95, 45-47 (July, 1953)

In a former investigation it was found that whole clams (Paphia staminea) had a relatively high vitamin B_{12} content. It was later found that many marine invertebrates contained significant, though variable, amounts of this vitamin. A Swedish investigator at the British Institute of Seaweed Research has also found that certain species of seaweeds contain relatively large amounts of vitamin B_{12}. The authors have conducted a study to determine whether the vitamin B_{12} that occurs in marine invertebrates and seaweeds belongs to the true or false vitamin B_{12} class. Previous work has indicated that the vitamin B_{12} that occurs in fish is probably largely, or possibly entirely, the true form.

Paper chromatography followed by bioautographs was used to distinguish the true from the false form. Dye was added to the medium, causing the growing bacteria to assume a purple color. The method will detect as little as one part of vitamin B_{12} in 1,000,000,000 parts of the original material.

A small amount of cyanide and a trace of acetic acid were added to the solvent used to develop the chromatograph. This caused all forms of vitamin B_{12} to react in the same manner as vitamin B_{12} itself. The acid extract of clams contained a fairly large proportion of true vitamin B_{12} but there were two other zones that did not appear to correspond with true vitamin B_{12}. One remained at the point of application and its nature is

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 ABSTRACTER: Neva L. Karrick

CAN VACUUM MEASUREMENT

COLOR TEST FOR HERRING RANCIDITY

VITAMIN B_{12} AND APF IN MARINE PRODUCTS

VITAMIN B_{12} IN CLAMS AND SEAWEEDS

8.64 (Cross Reference: 1.82)

not known. Repeated extractions of the clam residue with benzyl alcohol did not completely remove this vitamin B_{12}-active material. Further work is being done in an attempt to ascertain its nature.

Samples of eight different varieties of British Columbia seaweed were obtained in late April. Relatively small amounts of true vitamin B_{12} and no false vitamin B_{12} were found in all of them. Since these seaweeds were collected before vigorous growth of the weeds had occurred, samples will be collected later in the season to repeat the results both qualitatively and quantitatively.

Table 2

"Soluble"	Yield %	Moisture %	In dry matter: Total N %	In dry matter: Ash %	In dry matter: B_{12} γ %
Bonito (liver	29.67	32.51	11.79	7.53	46
Bonito (pyloric-appendage	24.30	32.85	11.42	11.90	32
Bonito (heart	24.30	19.69	12.07	7.48	51
Bonito (intestine	21.43	21.46	11.72	8.96	38
Yellow-fin albacore (liver	20.90	21.62	12.03	7.58	102.1
Yellow-fin albacore (pyloric-appendage	19.53	41.13	11.79	12.23	22.4
Yellow-fin albacore (stomach	26.60	32.30	13.34	5.72	9.3
Yellow-fin albacore (meat	24.62	26.36	13.59	6.17	6.0
Cuttlefish (meat	26.17	48.75	12.59	8.75	16.6
Cuttlefish (viscera	26.46	43.18	12.34	8.61	52.8
Venerupis semidecussata	9.63	32.33	9.09	18.19	20.4
Oyster	16.58	36.88	5.13	8.11	30.0
Fish Oil Residiuum Concentrate	-----	50.85	9.75	24.49	65.0

Table 3. Average increase of chick body weight in 4 weeks

Supplement of solubles to diet: Solubles	%	B_{12} γ%	Average increase of body weight	Number of died	Rate of increase
Bonito: pyloric-appendage	7.29	1.60	142.2 g.	0	115.4
Bonito: intestine	6.43	1.93	146.9	0	119.2
Bonito: heart	7.29	2.99	148.7	0	120.7
Bonito: liver	8.90	2.76	142.6	0	115.7
Fish soluble*	3.00	0.96	130.7	0	106.2
None	0	0	123.2	0	100

* Fish Oil Residiuum Concentrate (Western Processors) was used.

Table 4. Average increase of chick body weight in 4 weeks

Supplement of solubles to diet: Solubles	%	B_{12} γ%	Average* increase of body weight	Average increase of body weight	Number of died	Rate of increase
Yellow-fin albacore: liver	6.27	5.00	133.7 g.	215.1 g.	0	145.2** (155.2)
Yellow-fin albacore: pyloric-appendage	5.86	0.77	127.9	196.6	0	(138.8) 142.1
Yellow-fin albacore: stomach	7.98	0.50	115.9	176.4	0	115.7
Yellow-fin albacore: meat	7.39	0.33	107.6	--	0	127.7 116.4
Fish soluble I	3.00	0.96	103.1	168.5	0	117.4
" " II	6.00	1.92	120.4	186.1	0	(131.7) 121.6
None			92.1	153.3	0	100

* Average increase of body weight in 3 weeks.
** ( ) shows the rate of increase in 3 weeks.

Table 5. Average increase of chick body weight in 4 weeks

Supplement of solubles to diet: Solubles	%	B_{12} γ%	Average increase of body weigt	Number of died	Rate of increase
Cuttlefish: meat	7.85	3.67	169.9 g.	0	94.3
Cuttlefish: intestinal organs	7.94	2.38	232.3	0	128.8
Venerupis semidecussata	2.89	0.41	202.1	0	115.5
Oyster	4.97	0.95	210.7	0	116.9
B_{12} (Cytogen)	2	2.0	208.4	0	115.6
None			180.3	0	100

8.64

7.874 (Cross Reference: 1.2)

3.30 (Cross Reference: 7.89)

8.53 ANNUAL REVIEW OF LITERATURE ON FATS, OILS, AND SOAPS. II.

Piskur, M. M.
Journal of the American Oil Chemists' Society 30, No. 6, 228-246 (June, 1953)

Refined finback whale oil is as nutritious as soybean oil when judged from growth attained by white rats fed diets of 20% oil (Sakurai et al.--J. Japan. Soc. Food Nutr. 3, 155). Polymerized whale oil is harmful to the rats. Tests on human subjects with whale, shark, sardine, rice-bran, and hydrogenated products of these at 40 grams per day indicate that utilization of each of these is about the same, i.e., digestibility ranges from 92 to 95% (Matsumura--J. Japan Biochem. Soc. 23, 26).

Grey seal milk resembles whale milk in that its fat content is of the order of 10 times that found in milks of land animals (Meara--Biochem. J. 51, 190). The fat acid composition of the seal milk is similar to that of blubber oil.

The saturated acid contents of Antarctic, Atlantic fin, and pike whales are respectively 28, 23, and 15-17.8%. The figures differ very little with season and different catching regions (Pedersen--Hvalradets Skrifter, Norske Videnskaps-Akad. Olso, No. 34, 1). Thus determination of saturated acids may be useful for distinguishing pike whale oil from oils of large species. Analyses of oil from dolphin body by Cmelik (Bull. soc. chim. Belgrade 15, 173) indicate that subcutaneous fat does not contain highly unsaturated acids such as clupanodonic acid, and that the jaw oil fatty acids are chiefly esters of myristyl alcohol and those of head oil esters of palmityl alcohol.

Fish oil analyses of interest because of geographical location or source are on 12 marine fish oils of Bombay (Patakoot et al.--J. Univ. Bombay 19B, Pt. 3, No. 28, 18), on

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Reprinted in part

8.6177 STUDIES ON FLUCTUATION OF THE VITAMIN A CONTENT IN FISHES.--I. STUDY ON VITAMIN A IN THE DOGFISH, SQUALUS SUCKLEYI

Higashi, Hideo; Hirao, Shuichi; Shimizu, Kazuko; Yamada, Juami; and Kikuchi, Ryo
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 7, 310-318 (1953)

Using dogfish caught off Onahama in the northern region of the Pacific coast, the authors determined the vitamin A content in the various internal organs, flesh, eggs and embryos. The results obtained are as follows:

a) The vitamin A content in the lipids of the liver, kidney, pancreas, and spleen are very high, while that of the flesh and eggs remain low (Table 1).
b) The liver contains more than 98 percent of the total vitamin A in the fish (Table 2, 3).
c) The vitamin A content per gram of each tissue decreases in order of the liver, kidney or pancreas, and spleen (Table 4). In many cases the vitamin A content in each of the internal organs varies in proportion to that of the others (Table 5).
d) The individual variation of the vitamin A content in the internal organs is most remarkable in the liver and pancreas which are followed by the kidney and spleen. However, in case of the flesh, eggs, and embryos, the individual variation is not so great as that of these organs (Table 6).
e) The vitamin D content in the liver oil was determined as shown in Table 8.

The authors also studied the problem of vitamin A accumulation. If the dogfish lives on food rich in vitamin A such as the pollack and so forth, and if the accumulative ratios of vitamin A and proteins of the dogfish are equal to those of cultured eels

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8.7 ON THE STUDY OF A WHALE (ZIPHIUS CAVIROSTRIS, CUVIER) HEAD BLUBBER OIL

Igarashi, Hisanao; Zama, Kouichi; and Ishigaki, Akira
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 10, 493 (1953)
(English summary and tables)

The chemical and physical constants of a whale (Ziphius cavirostris, Cuvier) head blubber oil are reported as follows: Sp. Gr. (20°C.) 0.8914, n_D^{20} 1.4628, Acid Value 0.73, Saponification Value 182.7, Iodine Value 71.1, Reichert-meissl Value 2.49, Mixed fatty acids 70.6%, Unsaponifiables 29.4%.

The constants for the mixed fatty acids are reported as follows: n_D^{25} 1.4513, Neutral Value 203.1, Iodine Value 75.9. The mixed fatty acids are fractionated by a modified Pb-salt method and are reported to consist of 31.25% solid and 68.75% liquid acids.

The solid acids consisted of myristic, palmitic and stearic acid, and the liquid acids consisted of tetradecenoic acid ($C_{14}H_{26}O_2$), hexadecenoic acid ($C_{16}H_{30}O_2$), and octadecenoic acid ($C_{13}H_{34}O_2$). etc.

On the other hand, the constants for the unsaponifiable matter are reported as follows: m.p. 24.5-25.5°C., n_D^{26} 1.4557, D_4^{35} 0.8778, Iodine Value 65.5.

The unsaponifiable matter is fractionated into 27.5% of solid and 62.5% of liquid by solubility to acetone. (Editor's note: The foregoing figures are reprinted as they appear in the original journal.)

Cetylalcohol and octodecyl alcohol are obtained from the solid fraction and oleyl-alcohol from the liquid fraction.

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8.64 ANIMAL PROTEIN FACTOR (APF) AND VITAMIN B_{12} IN MARINE PRODUCTS

See below for authors
Bulletin of the Japanese Society of Scientific Fisheries 19, No. 1, 45 (1953)

III. Seaweeds and others
Hashimoto, Yoshiro and Sato, Tokuji

The vitamin B_{12} content of about thirty species of seaweeds determined by the Euglena method varied from 0.1 to 4 γ% on the fresh basis and about twenty species among them contained less than 1.0 γ %. The thin or finely branched seaweeds generally contained much vitamin B_{12}. Asakusanori (the air-dried product of Porphyra tenera) was very rich and contained from 13.2 to 18.6 γ % B_{12}. The utilization of marine algae as APF feed for domestic animals may be confined to only few species, if possible.

Several zoo- and phytoplanktons were also determined on their B_{12} content; Daphnia pulex 3.8, Mysis sp. 0.9, Skeletonema costatum 8.5, Microcystis sp. 4.8, Scenedesmus obliquus 0.15 and Chlorella elipsoidea 2.5-3.1 on the fresh basis. Another eight preparations of air-dried Chlorella contained from 4.2 to 8.9 γ % B_{12}. The relatively high content of a diatom and some fresh-water unicellular algae, such as Microcystis and Chlorella is noticeable.

The bottom mud of a fresh-water pond was very rich in vitamin B_{12}, perhaps produced by soil microorganisms. (0.8-3.1 γ % on fresh basis).

(over)

Reprinted in part

REVIEW OF LITERATURE ON FISH OILS

WHALE HEAD OIL

FLUCTUATION IN VITAMIN A CONTENT IN DOGFISH

VITAMIN B_{12} IN MARINE PRODUCTS

8.7 (Cross Reference: 4.14)

8.53 (Cross Reference: 4.90)

Indian freshwater fish oils (Pathak & Agarwal--Biochem. J. 51, 264), and on oil from body and liver of Japanese swell-fish (Kaneko et al.---J. Japan Chem. 3, 23).

Bath Clupea ha[illegible] banana body	2[illegible]	[illegible]	[illegible]	[illegible]	C_{14} (—2H) 0.2, C_{16} (—2.7H) 25.3, C_{18} (—5.7H) 7.5, C_{22} (—9H) 10.1, C_{24} (—1H) 1.2
Clupea [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Clupea [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C_{16} 3.1, C_{18} trace, C_{20} (—2H) 7, C_{22} (—4.8H) 26.5, C_{24} (—6.5H) 9.4, C_{26} (—8H) 2.6
[illegible] Scomber [illegible]	1[illegible]	1[illegible]	[illegible]	—28.4 (—3.0H)—	C_{14} 0.2, C_{16} (—2H) 0.6, C_{18} (—2.6H) 15.1, C_{20} (—8H) 17.1, C_{22} (—9.2H) 10.3
Mallotus [illegible] liver[illegible]	1[illegible]	14.2	4[illegible]	—32.6 (—2.4H)—	C_{16} (—2H) 0.4, C_{18} (—2H) 8.4, C_{20} (—5.3H) 19.8, C_{22} (—6H) 19.1

15. Pathak & Agarwal *Biochem J 51*, 264.
16. Pedersen. *Tids. Kjemi, Bergvesen Met. 12*, 83.

8.64

IV. Variations in the Vitamin B_{12} Content of Marine Animals in Spoilage
Mori, Takajiro; Hashimoto, Yoshiro; and Maeda, Yasuhiko

The vitamin B_{12} content was determined by the Euglena method on the digested samples with trypsin. In the spoilage of marine animals, marked fluctuations of vitamin B_{12} content were observed. As the recovery test of vitamin B_{12} with putrid fish meat gave the same result as in the case of fresh meat, the variation must be considered as the increase or decrease of vitamin B_{12} itself. As a whole, B_{12} content decreased generally when the round fishes were allowed to spoil; for instance, the B_{12} content of carp liver decreased from 8.0 to 0.9 γ% in 36 hrs. and the dark-colored meat of jack mackerel from 11.2 to 0 γ% in 3 days in the most marked cases. The decrease was less or, on the contrary, considerable increase was observed in some cases, when fish were spoiled in the state of minced flesh or organs. Minced clam meat showed the most remarkable increase, namely, the B_{12} content became four to sixfold in four to nine days putrifaction.

As the variation was prevented by the addition of toluene or by the cold storage at -2 to -5°C., the bacterial synthesis or decomposition seems to be the main cause of it. The vitamin B_{12} splitting enzyme was not detected on the glycerine and water extracts of mackerel liver and carp meat.

8.6177

which are about 20 percent of total weight of the stomach contents, the large individual variation of the vitamin A content in the dogfish liver can simply be ascribed to food and growth of the fish. However, if the dogfish lives on food far poorer in vitamin A such as squids and the rock cod, Sebastolobus machrochir, as often found in the stomach of it, the fish would have to take a great amount of food for its life.

Table 4 The vitamin A content per gram of tissue in different parts.

No. of main title	魚種番号	体重 Body weight	肝臓 Liver	腎臓 Kidney	膵臓 Pancreas	脾臓 Spleen	肉 Flesh	卵 Egg	白子 Fishery
		gr	USPU/gr	USPU/gr	USPU/gr	USPU/gr	USPU/gr	USPU/gr	USPU/gr
1	〃	7,400	43,962	936	2,273	211			〃
2	〃	6,700	41,453	958	2,058	201			〃
3	〃	7,600	18,280	296	304				〃
4	〃	6,900	26,500	89	4,615	236			〃
5	〃	7,020	10,568				12	30	〃
6	〃	7,870	13,300	401	103	5		33	34
8	〃	6,980	17,571				19	77	〃
9	〃	7,900	2,020	70	22			24.4	23.4
10	〃	6,220	13,020	136	31				
11	〃	6,500	6,466	217	337			63	〃
12	〃	6,755	1,869	94	391	38			
13	〃	7,650	20,485	381	1,046	129	15	45	24.6
14	〃	6,570	16,191	233	418	71	8	15	〃 7
15	〃	4,400	3,260	116					
17	〃	4,650	24,235				12	33	
19	〃	1,980	309	26	7	25	3	0.96	〃
23	〃	634	103	105	77				
24	〃	525	106	18	66				
26	〃	2,225	872	51	56			〃	〃
27	〃	1,300	1,377	23	40	31	3.3	〃	〃
28	〃	1,400	1,300					〃	〃

0.31 HIGHLY PURIFIED SQUALENE

Morri, Kozo
Japanese Patent No. 3275 June 22, 1951
Chemical Abstracts 47, No. 4, 1903 (1953)

0.39 BIOLUMINESCENCE: EVOLUTION AND COMPARATIVE BIOCHEMISTRY

Harvey, E. Newton
Federation Proceedings 12, No. 2, 597 (June, 1953)

The chemistry of bioluminescence of fish and molluscs as well as of insects and animals is discussed.

0.6 NEW PROCEDURES FOR EVALUATING THERMAL PROCESSES FOR FOODS IN CYLINDRICAL CONTAINERS

Stumbo, C. R.
Food Technology 7, No. 8, 309-315 (August, 1953)

(Abstract of this article appears under 3.33 page 7)

0.7 DEGENERATIVE JOINT DISEASE IN MICE FED HIGH-PROTEIN DIETS

Silberberg, Martin and Silberberg, Ruth
J. Gerontol. 7, 24-31 (1952)
Chemical Abstracts 47, No. 4, 1802 (1953)

1.015 A REVIEW OF THE INDIAN OIL SARDINE FISHERY

Nair, R. V. and Chidambaram, K.
Proc. nat. Inst. Sci. India 17, 71-85 (1951)
Food Science Abstracts 25, No. 2, 157 (March, 1953)

The oil sardine, Sardinella longiceps, is the most valuable fish of the west coast of India. The amounts landed vary greatly from year to year; heavy landings contain large proportions of immature fish, and are followed by poor seasons. Large amounts of fish have been used for manufacturing oil, meal and manure, and for feeding pigs and poultry. Canning of sardines was carried out for a time, but has now ceased. Legislation to diminish inroads on immature fish in good fishing years might reduce the fluctuations in landings and thus simplify manufacturing problems.

1.1 NOTES FROM NORWAY

Whiteleather, R. T.
Pan American Fisherman 8, No. 1, 23 (August, 1953)

(Abstract of this article appears under 1.0141 page 15)

1.2 THE APPLICATION OF THE THIOBARBITURIC ACID TEST TO THE DETERMINATION OF OXIDATIVE RANCIDITY IN FROZEN HERRING

Fridriksdottir, Sigrun
Student Report on Special Problem, Cornell University, Ithaca, N. Y. (1953), 35 pp.

(Abstract of this article appears under 7.874 page 17)

1.5 HOW TO DETERMINE IF ATMOSPHERIC CONDITIONS ARE FAVORABLE FOR THE ARTIFICIAL DRYING OF SALTED CODFISH

Legendre, R.
Fisheries Research Board of Canada, Progress Reports of the Atlantic Coast Stations, No. 56, 23 (July, 1953)

(Abstract of this article appears under 3.7 page 5)

1.82 VITAMIN B_{12} IN MARINE INVERTEBRATES AND SEAWEEDS

Southcott, B. A. and Tarr, H. L. A.
Fisheries Research Board of Canada, Progress Reports of the Pacific Coast Stations, No. 95, 45-47 (July, 1953)

(Abstract of this article appears under 8.64 page 17)

1.92 MANITOBA'S BULLHEAD FISHERY

Butler, M. E.
Canadian Fisherman 40, No. 8, 19 (August, 1953)

(Abstract of this article appears under 1.0111 page 13)

2.00 STUDIES ON SHARK MUSCLE. PART 2. HISTOCHEMICAL STUDIES OF SHARK MUSCLE DECOMPOSITION

Ohoishi, Keiichi
Bulletin of the Faculty of Fisheries Hokkaido University 3, No. 4, 221 (March, 1953)

When the muscles are regarded as being putrefactive nuclei of muscular cells, cross striations, and the prescence of muscle urea become less obvious and vacuoles appear in the muscle fibre.

2.08 HANDLING TROLL SALMON--FISHERY NOTE NO. 36

Anonymous
U. S. Department of the Interior, Fish and Wildlife Service, Fishery Products Report No. 90, Seattle, Washington (May 8, 1953)

(Abstract of this article appears under 2.19 page 3 - August, 1953 issue)

2.08 RELATIVE IMPORTANCE OF THE FACTORS CAUSING SPOILAGE OF FISH IN BOATS AT SEA

Castell, C. H. and MacCallum, W. A.
Fisheries Research Board of Canada, Progress Reports of the Atlantic Coast Stations, No. 55, 17-23 (March, 1953)

(Abstract of this article appears under 2.19 page 7 - July, 1953 issue)

2.113 GREGARIOUSNESS IN BARNACLES IN RELATION TO THE FOULING OF SHIPS AND TO ANTI-FOULING RESEARCH

Knight-Jones, E. W. and Crisp, D. J.
Nature 171, No. 4364, 1109 (June 20, 1953)

2.113 ZINC METALLIZING USED ON STEEL CLAM BOAT

Anonymous
Atlantic Fisherman 34, No. 5, 17 (June, 1953)

2.114 LOADING PUMP SETS RECORD OF MORE THAN 1,000,000 LIVE FISH PER HOUR

Anonymous
Southern Fisherman 13, No. 5, 78 (May, 1953)

2.114 MULTI-ENGINE DRIVES IN FISHING CRAFT

Selman, G. S.
Canadian Fisherman 40, No. 5, 28 (May, 1953)

2.116 A COMPLETE OUTLINE OF LORAN EQUIPMENT AND ITS OPERATION FOR FISHING BOATS

Anonymous
Fishing Gazette 70, No. 4, 106 (April, 1953)

2.12 SHELLFISH EXPLORATIONS IN CERTAIN SOUTHEASTERN ALASKAN WATERS BY THE JOHN N. COBB, SPRING 1952

Schaefers, Edward A.
Commercial Fisheries Review 15, No. 3, 1 (March, 1953)

2.14 THE TROLL FISHERY OF BRITISH COLUMBIA

Milne, D. J.
Trade News 5, No. 10, 3 (April, 1953)

2.14 FISHING BY ELECTRICITY

Burnet, A. R. M.
Canadian Fisherman 40, No. 8, 21 (August, 1953)

The article describes the use of an electrical stunning device in collecting specimens for biological study.

2.3 THE PROBLEM OF SLIME IN THE SANITATION OF FISH PLANTS

Castell, C. H.
Fisheries Research Board of Canada, Progress Reports of the Atlantic Coast Stations, No. 56, 5-9 (July, 1953)

(Abstract of this article appears under 3.18 page 7)

2.3 STUDIES ON THE METHOD OF GATHERING SHELL-MEATS FROM SHELL-FISH. PART 3. ON VARIOUS IMPROVED METHODS OF CHEMICAL SHUCKING AND A NEW METHOD OF OPENING (HIGH TEMPERATURE PROCESS)

Miyake, Masato
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 8, 373 (1953)
(English summary and table)

2.43 PAPER CUP CONTAINERS

Rosapepe, Joseph S.
Fishing Gazette 69, No. 13, 178, Annual Review Number (1952)

(Abstract of this article appears under 3.238 page 7)

2.6 USE OF FISH IN NEW ENGLAND SCHOOLS INCREASED BY DEMONSTRATIONS

Lindgren, B. E. and Seifert, R. P.
Commercial Fisheries Review 15, No. 2, 18-22 (February, 1953)

(Abstract of this article appears under 2.8 page 5 - August, 1953 issue)

2.8 TRICKS OF MY TRADE

Diat, Louis
Gourmet XII, No. 5, 22-23, 26-30 (May, 1953)

A well-known French chef presents some of his favorite recipes for marine and fresh water fish.

2.9 IV. CHEMICAL STUDIES ON POISONOUS ELEMENT IN BIVALVE SHELL

Mori, Takajiro and Hashimoto, Yoshiro
Journal of Fisheries Research Institute (Tokyo, Japan), No. 3, 37 (December, 1950)

2.9 A TOXIN OF GLOBEFISH. IV.

Yokoo, Akira
Proc. Japan Acad. 28, 200-2 (1952) (cf. C.A. 45, 6759c)
Chemical Abstracts 46, No. 22, 11468 (1952)

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California Fish and Game
Canadian Fisherman
Canadian Journal of Chemistry
Canadian Journal of Technology
Canner
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Chemical and Engineering News
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Chemistry and Industry
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Commercial Fisherman
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Food Technology
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Journal of Home Economics
Journal of Nutrition
Journal of the American Chemical Society
Journal of the American Dietetic Association
Journal of the American Oil Chemists' Society
Journal of the Assòciation of Official Agricultural Chemists
Journal of the Fisheries Research Board of Canada
Journal of the Science of Food and Agriculture
Maine Coast Fisherman
Modern Packaging
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Modern Sanitation
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Nature
Nutrition Reviews
Oil, Paint and Drug Reporter
Pacific Fisherman
Pan-American Fisherman
Poultry Science
Practical Home Economics
Progressive Fish-Culturist
Quick Frozen Foods
Refrigerating Engineering
Report of the Food Investigation Board (Great Britain)
Science
Seafood Business
Southern Fisherman
Trade News (Fisheries Department, Canada)
Western Canner and Packer
Western Fisheries
World Fishing

Articles chosen for abstracting or inclusion as bibliographical references are those deemed of interest to the commercial fisheries and to fishery technological laboratories. Occasionally pertinent articles from sources other than the above listed publications are included. Biological papers are generally omitted.

3.13 CONTROL OF RANCIDITY IN FISH FLESH. II. PHYSICAL AND CHEMICAL METHODS

Tarr, H. L. A.
Journal of the Fisheries Research Board of Canada II, No. 5, 237-247 (August, 1948)

(Abstract of this article appears under 3.249 page 17 - August, 1953 issue)

3.30 AUSTRALIA'S CANNED FISH INDUSTRY

Knox, Peter
Food Manufacture 28, No. 8, 324-325 (August, 1953)

(Abstract of this article appears under 1.017 page 15)

3.30 OCCURRENCE AND NATURE OF BACTERIA IN CANNED BEEF

Ayres, John C. and Adams, A. T.
Food Technology 7, No. 8, 318 (August, 1953)

3.18 ODOUR CONTROL WITH ULTRA-VIOLET RADIATION

Summer, W.
Food Manufacture 28, No. 6, 230-235 (June, 1953)

(Abstract of this article appears under 6.135 page 5 - September, 1953 issue)

3.5 HOW TO DETERMINE IF ATMOSPHERIC CONDITIONS ARE FAVORABLE FOR THE ARTIFICIAL DRYING OF SALTED CODFISH

Legendre, R.
Fisheries Research Board of Canada, Progress Reports of the Atlantic Coast Stations, No. 56, 23 (July, 1953)

(Abstract of this article appears under 3.7 page 5)

3.5 STUDIES ON FISH CURING. PART I. THE PRESERVATIVE EFFECT OF THE DRIED AND SALTED FISH MEAT

Murata, Kiichi and Ohoishi, Keiichi
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 10, 541 (1953)

The preservative effect of curing fish by drying and by salting, was studied.

4.13 THE LIPIDS OF FISH. 3. THE ACETONE-INSOLUBLE FRACTION OF AN ACETONE EXTRACT OF THE FLESH OF THE HADDOCK

Olley, June and Lovern, J. A.
Biochemical Journal 54, No. 4, 559-569 (July, 1953)

(Abstract of this article appears under 8.53 page 13 - September, 1953 issue)

4.14 ON THE STUDY OF A WHALE (ZIPHIUS CAVIROSTRIS, CUVIER)

Igarashi, Hisanao; Zama, Kouichi; and Ishigaki, Akira
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 10, 493 (1953)

(Abstract of this article appears under 8.7 page 19)

4.22 HYDROGENATION OF MARINE-ANIMAL OIL

Miyake, Ryoichi et al.
Japanese Patent No. 3078, June 13, 1951
Chemical Abstracts 47, No. 2, 895 (1953)

5.112 STABILIZATION OF FISH-LIVER OIL, FATS AND OILS, AND VITAMIN A

Moritaka, Jiro
Japanese Patent No. 3747, July 16, 1951
Chemical Abstracts 47, No. 4, 1904 (1953)

5.122 VISION

Wald, George
Federation Proceedings 12, No. 2, 606 (June, 1953)

The role of vitamin A in vision is discussed.

5.2 BIOSYNTHESIS AND ENERGY TRANSPORT BY ENZYMIC REDUCTION OF "ONIUM" SALTS

Woolley, D. W.
Nature 171, No. 4347, 323-328 (February 21, 1953)

(Abstract of this article appears under 0.38 page 3 - September, 1953 issue)

5.41 STUDIES ON THE ANTIANEMIC INGREDIENT OF LIVER--IV. ON A LIVER COMPONENT EFFECTIVE TO FORTIFY THE TOLERANT CAPACITY FOR THE HIGH ALTITUDE

Tomiyama, Tetuo; Yabuki, Teruo; and Yone, Yasuo
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 7, 299 (1953)
(English summary, tables, and figures)

Adult mice fed a diet with a solubilized liver for a week, survived twice as long as their respective controls upon daily exposing to air pressure of 205 mm. of mercury.

5.41 STUDIES ON THE ANTIANEMIC INGREDIENT OF LIVER--V. A SIMILARITY BETWEEN THE ANTIANEMIC INGREDIENT AND A LIVER COMPONENT EFFECTIVE TO FORTIFY THE TOLERANT CAPACITY FOR HIGH ALTITUDE

Tomiyama, Tetuo; Yabuki, Teruo; and Yone, Yasuo
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 7, 305 (1953)
(English summary and figures)

5.41 INTERRELATIONSHIPS BETWEEN VITAMIN B_{12} AND METHIONINE IN METABOLISM

Edwards, Cecile Hoover and Carter, Ruth T.
Federation Proceedings 12, No. 1 (Part I), 413 (March, 1953)

5.42 STUDIES ON ANTIANEMIC INGREDIENT OF THE LIVER--VI. ON THE GROWTH-PROMOTING EFFECT OF LIVER EXTRACT AND ITS PUTRIFIED FRACTIONS UPON LEMNA PAUCICOSTATA HEGELM

Yone, Yasuo and Tomiyama, Tetuo
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 12, 659 (1953)
(English summary, tables and figures)

Solubilized whale and bovine liver and its active carbon-adsorbate were effective in promoting growth whereas a non-adsorable fraction was ineffective.

5.42 STUDIES ON ANTIANEMIC INGREDIENT OF THE LIVER--VII. THE GROWTH-PROMOTING EFFECT OF SEVERAL ANTIANEMIC SUBSTANCES UPON LEMNA PAUCICOSTATA HEGELM

Yone, Yasuo and Tomiyama, Tetuo
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 12, 664 (1953)
(English summary, figures and tables)

"The growth-promoting effect was increased by repeating the adsorption of the whale-liver extract upon activated charcoal followed by the elution with a dilute alkaline solution."

6.0 ALASKA SALMON POTENTIAL

Craven, Howard J. (Fish and Wildlife Service, Ketchikan)
National Fisheries Yearbook, 107 (1953)

The author discusses the utilization of Alaska salmon cannery waste.

6.10 FISH MEAL AND OIL PRODUCTION

Carsten, H. A.
Canadian Fisherman 40, No. 7, 12 (July, 1953)

6.130 RECOVERY OF OIL AND MEAL FROM OIL-BEARING FISH

Davis, Walter C.
U. S. Patent No. 2,614,110, October 14, 1952
Chemical Abstracts 47, No. 2, 796 (1953)

6.139 THE EFFECT OF HEAT ON THE NUTRITIVE VALUE OF MILK PROTEINS AS INFLUENCED BY WATER AND FAT

Schroeder, Lawrence J.; Iacobellis, Michael; Lees, Helen; and Smith, Arthur H.
Journal of Nutrition 50, No. 3, 351 (July 10, 1953)

Tests on adult dogs have shown that autoclaving non-fat dry milk solids results in a decrease in the digestibility and nutritive index of the milk proteins.

6.190 IMPROVING THE NUTRITIVE VALUE OF CEREAL GRAINS. I. IMPROVEMENT IN THE EFFICIENCY OF THE PROTEINS IN MILLED WHEAT FLOUR WITH LYSINE, VALINE, THREONINE AND AN EXTRACT FROM CONDENSED FISH SOLUBLES

Sure, Barnett
Journal of Nutrition 50, No. 2, 235 (June 10, 1953)

A study was made, using the albino rat as the experimental animal, of the influence of additions of the amino acids, lysine, valine and threonine, and an extract from condensed fish solubles, on the efficiency of the proteins in vitamin-enriched milled wheat flour. It was found that the additions of such micronutrients changed the protein efficiency ratio of the proteins in white flour from 0.68 to 3.11.

6.192 ANTIBIOTIC AND VITAMIN B_{12} SUPPLEMENTS AS RELATED TO THE CRUDE PROTEIN LEVEL OF BOBWHITE QUAIL DIETS

Baldini, James T.; Roberts, Roy E.; and Kirkpatrick, Charles M.
Poultry Science 32, No. 4, 563 (July, 1953)

Growth was not improved by either condensed fish solubles or the antibiotic and B_{12} supplement, or a combination of these, when the protein level was 24 or 28 percent of the diet.

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7.879 THE USE OF ANTIOXIDANTS IN DRY DOG FOOD

Neumer, John F. and Dugan, L. R. Jr.
Food Technology 7, No. 5, 189-191 (May, 1953)

(Abstract of this article appears under 4.64 page 11 - July, 1953 issue)

7.89 ESTIMATING VACUUM IN A CAN

Shiga, Iwao and Kimura, Keiichi
Canner 117, No. 6, 18, 19, 44 (August 10, 1953)

(Abstract of this article appears under 3.30 page 17)

7.89 PHENOLS AS AN INDEX OF QUALITY OF FISH PREPARED BY COLD SMOKING

Uspenskaya, Z. P.
Rybnoe Khoz, No. 7, 57-8 (1952)
Chemical Abstracts 47, No. 11, 5574 (1953)

Phenols in fish specimens prepared by smoking vary considerably: 21-42 mg./100 g. in the meat and 25-58 in the skin.

7.89 STUDIES ON FISH MEAT JELLIES--III. MEASUREMENT OF PHYSICO-CHEMICAL PROPERTIES OF FISH PASTE

Matsumoto, J. Juichiro and Arai, Tomiko
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 7, 319 (1953)
(English summary, tables and figures)

7.81 THE FATE OF TRIMETHYLAMINE OXIDE AND TRIMETHYLAMINE IN MAN

Tarr, H. L. A.
Journal of the Fisheries Research Board of Canada V, No. 3, 211 (July, 1941)

(Abstract of this article appears under 0.39 page 17 - October, 1953 issue)

7.81 SPECIFICITY OF TRIAMINEOXIDEASE

Tarr, H. L. A.
Journal of the Fisheries Research Board of Canada V, No. 2, 187 (November, 1940)

(Abstract of this article appears under 0.38 page 17 - October, 1953 issue)

7.81 ASSESSMENT OF QUALITY

Anonymous
Report of the Food Investigation Board (Great Britain) for 1952, 30-31 (1953)

(Abstract of this article appears under 7.80 page 9 - October, 1953 issue)

8.43 FLUCTUATIONS IN THE CONTENT OF WATER AND FAT IN THE COD

Bogucki, M. and Trzesinski, P.
Biul. Morsk. Inst. Ryback, No. 5, 25-30 (1950)
Food Science Abstracts 25, No. 2, 154 (March, 1953)

(Abstract of this article appears under 8.50 page 19 - September, 1953 issue)

8.43 PHYSICO-CHEMICAL STUDIES ON THE SKIN AND LEATHER OF MARINE ANIMALS--IV. ON THE WATER OF SHARK SKIN

Takahashi, Toyoo and Shiokawa, Ayako
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 8, 333 (1953)
(English summary, figures and tables)

The distribution of water in a shark skin (water content 76.5%) is 73% between fibre-bundles, 15% in the space among individual fibres of the bundle, and 12% bound water.

8.43 CHEMICAL COMPOSITION OF THE BALTIC COD AND HERRING IN RELATION TO THE DEGREE OF SEXUAL MATURITY

Kordyl, E.
Prace Morsk. Inst. Ryback., No. 6, 145-147 (1951)
Food Science Abstracts 25, No. 2, 154 (March, 1953)

(Abstract of this article appears under 8.50 page 19 - September, 1953 issue)

8.42 BIOCHEMICAL STUDIES ON SKIPJACK, KATSUWONUS VAGANS--II. CONTENTS OF INORGANIC SUBSTANCES IN PYLORIC COECA

Horiguchi, Yoshishige,; Kashiwada, Kein-ichi and Kakimoto, Daiichi
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 7, 279 (1953)
(English summary and tables)

The cations--(Al, Zn, Fe, Ca, Mg, Na, K and the trace of Ni and Co), and the anions--(S, P, Cl and the trace of Si) were detected.

8.42 SOME IRON-CONTAINING SARDINE OILS

Czepelak, V. G.
Osterr. Leder-Ztg. 7, 113-16 (1952)
Chemical Abstracts 47, No. 3, 1415 (1953)

8.42 THE PRESENCE OF BISMUTH IN FISH BONES AND HUMAN TEETH AS REVEALED BY THE CATHODO-LUMINESCENCE METHOD OF ANALYSIS

Hakamori, Shin'ichiro and Tamura, Shohei
Bull. Chem. Soc. Japan 24, 117 (1951)
Chemical Abstracts 47, No. 3, 1264 (1953)

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